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An Address
ON THE
MALARIA TREATMENT OF GENERAL PARALYSIS OF THE INSANE.

Delivered at the Liverpool Medical Institution on Feb. 4th, 1926,

BY WARRINGTON YORKE, M.D. LIVERP.,
PROFESSOR OF PARASITOLOGY, UNIVERSITY OF LIVERPOOL.

ATTEMPTS to discover a successful treatment of general paralysis of the insane have taken two main lines; the one, which we might call specific therapy, is naturally of comparatively recent date and commenced with the recognition of the true nature of the disease, whilst the other—non-specific therapy—dates back to very early times.

Until recently all efforts at specific therapy have proved futile. Intrathecal, subdural, intraventricular, and intracisternal injections of salvarsan or of its various modifications, or of salvarsanised serum, were found to be just as useless as the earlier methods of inunction or intramuscular injections of mercury and of intravenous injections of salvarsan. In 1919 information regarding the mode of preparation and chemical constitution of a new arsenical—tryparsamide—was published by Jacobs and Heidelberg, of the Rockefeller Institute; and about the same time Pearce and Brown gave an account of its biological behaviour and therapeutic action on animals experimentally infected with trypanosomes. During the last six years this drug has been used extensively in the treatment of human trypanosomiasis—a disease which in many respects is closely allied to syphilis—with very remarkable results. In a recent review (Yorke, 1925) the published results have been collected and subjected to critical analysis, and it is now definitely established that not only does tryparsamide produce immediate peripheral sterilisation of the blood both in early and in very advanced cases, but that it exerts a profound influence on the meningeal reactions. In short, this drug possesses the unique power of benefiting, and apparently curing, a not insignificant proportion of cases in the second stage of sleeping sickness with altered cerebro-spinal fluid. Of recent years the drug has been employed, particularly in America, with considerable success in the treatment of general paralysis, and much is to be hoped from experimental work along these lines.

NON-SPECIFIC TREATMENT.

It is, however, with the second line of attack—the non-specific therapy—that we are concerned on the present occasion. Gerstmann (1925), in his excellent monograph on this subject, shows that the historical development of the non-specific treatment of general paralysis dates back to very early times; he records that Hippocrates and Galen knew that febrile disturbances might exert a curative effect on the course of psychosis, that Boerhaave and Sydenham were familiar with the curative influence of intercurrent fevers on mental disorders, and that Reuss in 1786 had observed the cure of mania through small-pox. The literature of the middle and latter portions of the nineteenth century contains numerous references to the improvement produced in psychoses by intercurrent febrile disturbances, such as typhoid, typhus, intermittent fever, cholera, variola, erysipelas, scarlatina, pneumonia, chronic suppuration, and abscesses.

These observations led gradually to the adoption of various procedures devised with the object of producing suppuration or fever; these consisted essentially of the injection of various substances which can be grouped into three classes: (1) substances not derived from micro-organisms—i.e., sodium nucleinate, phlogetan, albumose, peptone, and milk; (2) substances derived from micro-organisms—i.e., tuberculin, polyvalent typhoid, and staphylococcus vaccines; and (3) the living micro-organisms of infectious diseases. According to Wagner-Jauregg, who has devoted many years to the study of the subject, the weakest action is obtained from the substances of non-bacterial origin, a stronger action from those of bacterial origin, and the best action from the actual infective processes themselves. It was considerations of this nature which led Wagner-Jauregg in 1917 to attempt the treatment of general paralysis with tertian malaria.

Technique.

Of the three species of malaria parasites, undoubtedly the one to be used is that of simple tertian malaria (*Plasmodium vivax*); malignant tertian malaria is extremely dangerous; in quartan malaria the febrile attacks occur only every fourth day, and it has been found for this and other reasons less satisfactory than *P. vivax*. Malaria infection can be induced in either of two ways: (1) by the inoculation of infective blood from a patient suffering from malaria, and (2) by allowing infective anopheline mosquitoes to bite. In practice the most usual method is the former. The blood—1 or 2 c.cm.—can be injected either subcutaneously, intramuscularly, or intravenously; very occasionally subcutaneous or intramuscular inoculation for some unknown reason fails to infect, but in our experience intravenous injection is practically invariably successful. The arm-to-arm method of infection presents no difficulty in asylums and other institutions where large numbers of patients are available for treatment, but in the treatment of isolated cases it presents the practical difficulty that if the infected blood has to be obtained from a distance the malaria parasites which it contains may be dead before they are inoculated. Various procedures have been advocated for keeping malarial blood alive, but the most satisfactory is undoubtedly maintaining the blood to which a few drops of 50 per cent. glucose solution is added at low temperature, preferably on ice. If this is done the blood will remain infective for many hours.

After an incubation period varying from 3–22 days (usually 8–15 days) the patient develops fever and the malarial attacks commence. The febrile disturbances usually last about 8–12 hours and occur typically every other day; this is the typical simple tertian fever. Not infrequently, however, there may be a daily rise of temperature, the curve being of the quotidian type; or the fever may commence as tertian and then become quotidian or vice versa. Whether the fever is tertian or quotidian has nothing to do with the strain of parasites used, but is dependent upon the reaction of the host.

Experience has shown that it is desirable to allow the patient to have from 8–12 febrile paroxysms. Reaching a decision when to stop the malaria is the chief cause of anxiety to the practitioner; if the febrile attacks be stopped prematurely no good may result, and if they be allowed to continue too long the patient's life may be sacrificed. As a general rule, there should be no medicinal interference with the patient during the malaria. If the fever reaches alarmingly high levels (105° F. or more) it can be controlled by sponging; it is of the utmost importance to bear in mind that it is impossible to control the fever by the administration of small doses of quinine; the fever can at once be stopped by quinine, but it cannot be controlled and kept within moderate bounds by the use of fractional doses of this drug. Even such a small dose as 5 gr. may stop the fever, and this can only be regarded as a disastrous procedure, because not only is the treatment stopped prematurely and the chance of benefiting the nervous disease thereby nullified, but, as a rule, the patient cannot again be infected for some considerable period.

When the patient has had the requisite number of malarial paroxysms, or it has been determined for other reasons to stop the malaria, 30 gr. of quinine in solution should be given daily for three consecutive days; no further treatment is necessary and in the vast majority of cases the malaria is definitely cured; very rarely after an interval of one or more months a malarial relapse occurs, but this can be dealt with in a similar manner by the three days' course of quinine.

Indications and Results.

In considering the suitability of a case to undergo the malaria treatment, attention must naturally be paid to the somatic condition of the patient and to the age, stage, and form of the disease. As Gerstmann points out, the chief concomitant of syphilis of the central nervous system is disease of the circulatory system, particularly of the aorta. Frisch (1923) has shown that of 115 cases of nervous syphilis 39 per cent. had aortic disease and that this was present in 29 per cent. of paralytics; Löwenberg (1924) found

post-mortem changes in the aorta of 113 (33 per cent.) of 341 cases of general paralysis. Notwithstanding the frequency of aortitis in general paralysis, the condition is, however, as a rule not severe and rarely a cause of death; only nine of Löwenberg's 113 cases in which the aorta was affected exhibited aneurysms and only one died of the condition. The presence of aortitis is consequently not a contra-indication to the malaria treatment; but severe aortitis with aneurysmal dilatation and myocardial degeneration are undoubtedly contra-indications, as is also gross obesity, and the treatment in such cases may lead to sudden death. Such considerations in a disease like general paralysis in which the prognosis is otherwise hopeless do not appear to have much importance, and one can, I think, act on the general rule that all cases should be treated except those who are very advanced and in a feeble state of nutrition and bodily physique, and those in whom there is serious organic lesion with pronounced disturbance of function.

By far the most extensive records of the malaria treatment of general paralysis hitherto published are those from the Vienna Clinic, where the work was inaugurated as long ago as 1917 by Prof. Wagner-Jauregg. Gerstmann in his recent monograph gives the results in so far as they concern patients treated between 1917 and 1922. He observes that over 1000 cases of general paralysis have up to the end of 1924 been treated by this method, but that in dealing with a disease like general paralysis it is preferable to limit one's statistics to the 400 patients treated previous to 1923, so that only cases who had been observed for at least two years after treatment should be considered. In Table I. I have summarised the information given by Gerstmann regarding the results obtained in these patients.

TABLE I.—*Showing Results of Malaria Treatment in 400 General Paralytics at Vienna Compiled from Information Supplied by Gerstmann (1925).*

Date treated.	Total cases.	Complete remission.	Partial remission.	Slight change, no change, or dead.
1917	9	4	2	3
1919–1920 ..	25	8	3	14
1920–1921 ..	116	38	14	64
1921–1922 ..	250	83	40	127
Total ..	400	133 (33%)	59 (15%)	208 (52%)

It thus appears that one-third of the 400 Vienna cases which have been under observation for periods varying from two to seven and a half years after treatment have remained in a state of complete clinical remission.

The data available from this country is much less complete. The Whittingham Mental Hospital was the first institution in England to examine the treatment, and at the request of Dr. R. M. Clark, the medical superintendent, a number of his patients were infected with malaria at the Liverpool School of Tropical Medicine in July, 1922, and from these the strain was carried on at the asylum by direct inoculation from one patient to another. Shortly afterwards patients were infected at the Winwick, Rainhill, Belfast, and Sheffield mental hospitals. I have been able to accumulate the broad results obtained at these institutions, partly from papers published by the medical officers in charge of the patients and partly from information kindly supplied by the courtesy of the medical superintendents; this information is summarised in Table II.

These results, although less valuable than those from the Vienna Clinic, are nevertheless very encouraging. They naturally do not carry the weight of the Vienna series, as the treatment is of much more recent date, and consequently the post-treatment observation period is of necessity much shorter. However, the fact that of 299 patients 70 (23·4 per cent.) recovered sufficiently to be discharged from the asylums is striking testimony to the value of the treatment, when it is borne in mind that all the cases were asylum patients and that from none of these institutions had a case of general paralysis previously been discharged.

TABLE II.—*Showing Results of Malaria Treatment of General Paralytics in Five British Mental Hospitals.*

Mental hospital.	Total cases treated.	Discharged.	Greatly improved.	Slight improvement or no change.	Dead.
Winwick* ..	53	7 (13·2%)	9	22	15
Belfast†	72	24 (33·3%)	6	25	17
Rainhill† ..	74	14 (19%)	8	26	26
Sheffield† ..	53	18 (34%)	21 S.I.	7 N.C.	7
Whittingham‡	47	7 (15%)	—	33 S.I. or N.C.	7
Total ..	299	70 (23·4%)	—	—	—

* Data published by Davidson (1925).
† Information kindly supplied by the medical superintendents—viz., Dr. Graham, Dr. Reeve, and Dr. Vincent.
‡ Data published by Grant and Silverston (1924).
S.I. = Some improvement. N.C. = No change.

The larger proportion of apparent cures recorded by Gerstmann is doubtless due to the fact that the Vienna patients were pre-asylum cases and consequently less advanced at the time of treatment; this is borne out by the results obtained in Liverpool during the last three and a half years among pre-asylum cases where apparently complete remissions have been obtained in over a third of the patients. Analysis of the information supplied by Gerstmann indicates that remarkably few of those who exhibited complete remissions relapsed, and this agrees with our experience in the treatment of pre-asylum cases and also with the fact that very few of the patients discharged from the British asylums have so far had to be readmitted.

Can the Result of Treatment be Forecast?

The question whether it is possible in any particular patient to forecast the result of treatment is obviously one of great practical importance. Any of the following results may be obtained: (1) a remission so complete and lasting that the patient is apparently cured; (2) partial mental remission accompanied by so great a somatic improvement that the patient is physically apparently normal; (3) partial mental and physical improvement; (4) no change mentally, but some physical improvement; (5) the condition remains in statu quo; (6) death.

In a disease like general paralysis where the mental changes are pronounced, the only result which can be regarded as really satisfactory is that in which the remission is so complete that the patient regains his former mental and physical powers and is enabled to return to his occupation and once more become a reasonable and useful member of society. As the statistics which I have quoted show, this most desirable result is obtained in from 23 to 33 per cent. of cases. It is upon these results that the treatment is justifiable and, pending the discovery of something better, to be advocated at the present time.

Unfortunately, in many cases an intermediate result is obtained; the patient is neither killed nor cured, nor is the condition left unchanged to proceed on its natural course to a fatal termination. In these the course of the disease appears to be arrested, the patients improve physically to a truly remarkable extent, they become cleanly in their habits—as one medical officer of an asylum put it, "instead of having to change the bed linen eight or ten times a day once suffices." They regain to some extent their mentality, but this is all; they cannot return to work and are no longer useful members of society. Regarded from the purely utilitarian point of view this can only be described as a disastrous result, and from the same point of view the treatment cannot be justified. If, however, we regard the arresting of

pathological processes and the prolongation of human life as one of the objects of medical science, then we are compelled to conclude that even results of this category justify the treatment.

Beyond the obvious generalisation that the earlier the patient comes under treatment, the more likely is the result to be entirely satisfactory, it seems at present impossible to forecast the result in any particular case. Gerstmann, writing on the 1000 cases treated at the Vienna Clinic, states that "good remissions are to be expected in the so-called early cases, in maniacal cases, in cases of simple dementia, in cases characterised by seizures, and in tabetic cases; whilst poorer results are obtained in galloping cases, in advanced cases, in infantile-juvenile cases, and in senile cases."

It should be noted that the complete remission may be sudden and dramatic and may occur quite early, actually during the malarial attacks, or it may be slow and progressive and the full result may not be obtained until the lapse of several months after the treatment.

Finally, it cannot be ignored that even in the earliest and strongest patients the treatment is attended with a certain risk to life. This, however, is very slight in the average early case, provided the person who is in charge has the requisite knowledge of malaria, but in the hands of the inexperienced the malaria treatment is undoubtedly a two-edged sword; on the one hand, the physician may become unduly alarmed at the severity of the malarial manifestations and attempt prematurely to modify or even cut short the attacks by the administration of small doses of quinine, and thereby not only nullify the effects of the treatment but prevent its repetition for a considerable period, or, on the other hand, he may so delay interfering that the patient is killed by the malaria.

Disappearance of Pathological Reactions.

It is now definitely established that the pathological reactions of the serum and spinal fluid disappear completely in certain cases after malaria treatment. Gerstmann has collected very considerable data on this subject from the Vienna Clinic. As a rule, it is the inflammatory reactions—lymphocytosis and excess of globulin—which tend to subside first; whereas the non-inflammatory changes—Wassermann and Goldsol reactions—disappear much more slowly. Gerstmann observes, however, that the changes in these reactions appear at first to be quite independent of the clinical manifestations. Cases are met with in which there is complete clinical remission with little or no alteration of the serum and spinal fluid reactions, and, on the contrary, in other cases there may be no clinical change but very great improvement in the serum and spinal reactions. Apparently, from the point of view of prognosis much more importance is to be attached to the clinical manifestations than to alterations in the fluid reactions. Cases in which there is complete clinical remission may exhibit unchanged fluid reactions for prolonged periods, or these may slowly tend to become normal; whereas in those who exhibit no clinical remission, but markedly improved fluid reactions, these, as a rule, generally revert sooner or later to their previous pathological condition.

There is now available a considerable mass of information regarding the condition of the brain in general paralytics, who have died during, or at various intervals after, malaria treatment. Lewis, Hubbard, and Dyar (1924) carried out an exhaustive examination of the brains of four cases who had died after malaria treatment and failed to find spirochætes in two of them, and only comparatively few were discovered in the others; they remark upon the greatly diminished perivascular infiltration; Jossman and Steenaerts (1924) were unable to find spirochætes in the brains of eight similar cases. Sträussler and Koskinas (1923) reported upon the brains of three general paralytics, who had shown complete remission as the result of malaria treatment and had later died from intercurrent disease; the pathological changes discovered were so slight that the authors state it would have been almost impossible, without the clinical history, to have made a diagnosis of general paralysis. Gerstmann gives information regarding the case of a general paralytic who died as the result of an abdominal operation two and a half years after malaria treatment, and who in the interval had been perfectly well and able to work; surprisingly few pathological changes were found; the inflammatory changes were particularly scanty and consisted of sparse lymphocytes and exceptional plasma cells on occasional precapillary vessels; recent glia proliferation was completely absent, and the meninges showed only here and there slight lymphocyte infiltrations. Somewhat similar cases have recently been recorded by Löwenberg and by Steiner.

It is interesting to compare these observations with those of Sträussler and Koskinas on four patients who died during the attacks of malaria, and on 24 who died at the end of the malaria or shortly afterwards. In three of the four who died during the malaria attacks, the inflammatory and proliferative changes were present in a most striking degree and represented an exaggeration of what is usually found in general paralysis; in 15 of the 24 who died immediately, or shortly, after completion of the malaria treatment, the ordinary appearances typical of general paralysis were seen, but in the remaining nine there was evidence of a definite retrogression of the pathological processes. As the result of these observations Sträussler and Koskinas believe that the first effect of malaria infection on general paralysis is an acute increase in the infiltration and proliferative processes in the vessels and glia, and that this exacerbation of the inflammatory reactions is a forerunner of the following subsidence and is an indication of the tissue warfare against the syphilitic virus. In this connexion it should be noted that during the malarial attacks there is often a transient increase in the clinical manifestations of the disease and in the inflammatory changes in the cerebro-spinal fluid.

NEW OBSERVATIONS ON MALARIA.

I should like now to refer briefly to the other side of this subject. When Dr. Clarke, of Whittingham, first asked us to infect for him a number of cases of general paralysis, I had very little belief that it would do any good, but it at once occurred to me that as the alienists wished to call in the aid of a tropical disease to assist in the treatment of a mental disease, it was only right and proper that those whose interest lay in exotic diseases should seize the opportunity, which the occasion presented, of making a number of much desired observations on malaria. During the past three and a half years Dr. Macfie and I have devoted considerable time to this aspect of the subject and a number of very interesting facts—some of them, I think, of fundamental importance—have come to light.

Cure of Induced Malaria.

The first question which at once aroused the interest of those concerned with tropical diseases was the ease with which the induced malaria could be cured in the general paralytics. Wagner-Jauregg drew attention to this fact in his original paper: he pointed out that two or three weeks' treatment with moderate doses of quinine was apparently sufficient to cure the malaria and that relapses were exceedingly rare. Wagner-Jauregg believed this to be due to the fact that passage of the malaria parasites from patient to patient, instead of from mosquito to patient, as always happens in Nature, had in some manner modified the virulence of the parasite and rendered it more susceptible to quinine.

In order to obtain information on this point and on a number of others, it soon became obvious that we should have to infect general paralytics by Nature's method—i.e., by the bite of infective mosquitoes—instead of by direct inoculation of infected blood from another patient. In all, we have infected about 50 general paralytics with malaria by the bite of

infective mosquitoes, and the observations on malaria which I am about to summarise were made on these cases which are, of course, strictly comparable with the infections which occur in Nature.

Even up to the present time a number of authors, more particularly the French, still adhere to the view that there is only a single species of malaria parasite found in man; evidence was, however, adduced during this work which in our opinion renders the unicity hypothesis of the malaria parasites of man untenable.

The incubation period of simple tertian malaria in man was shown to vary considerably, the first rise of temperature occurring in from 9 to 22 days after the bites of infective mosquitoes and parasites appeared in the peripheral blood for the first time in from 13 to 21 days. Another interesting observation was that although the first parasites to appear in the peripheral blood were almost invariably trophozoites, in all cases gametocytes (forms which are capable of infecting mosquitoes) made their appearance two or three days later.

Action of Quinine.

Of much greater practical interest, however, are the observations which we have been able to make regarding the action of quinine in the cases of mosquito-induced malaria. Our inquiry followed two directions, firstly, to ascertain whether quinine given prophylactically prevented the development of malaria; and secondly, to examine the therapeutic action of the drug and determine whether the mosquito-induced malaria was as easily cured by a short course of the drug as are the inoculated cases, or whether they subsequently relapsed with the same regularity as did the war cases and the majority of cases in tropical practice.

Numerous observations showed that quinine has no true prophylactic action in malaria, the administration of such doses as 10 gr. in solution daily for five days before, the day of, and for eight days after the bite of infective mosquitoes failed to prevent the development of malaria, the patients developing fever and showing parasites in the blood in about the usual time; similar results were obtained in cases where 30 gr. of the drug in solution were given on the day of feeding infective mosquitoes and on each of the two following days. These experiments showed conclusively that quinine has no action on the sporozoites (infective germs) injected by the mosquito, and consequently that the drug has no true prophylactive action. When, however, the daily dose of quinine is continued for ten or more days after the meal of infective mosquitoes, the infection does not develop.

Therapeutic observations showed that the mosquito-induced malaria resembled the inoculated malaria in being remarkably susceptible to treatment, a short course of quinine, gr. 30 for three consecutive days being sufficient definitely to cure the malaria in 43 per cent. of cases; in the remaining 57 per cent. a relapse occurred for the most part between four and 11 months later, but in the great majority of the relapses the parasites and fever either disappeared spontaneously or as the result of only one more three-day course of quinine. The broad fact thus emerges that the administration of moderate doses of quinine for only a few days has in these cases sufficed either definitely to cure the malaria, or at least to control it for a period of 15 to 21 months.

These results are in striking contrast to those obtained in the treatment of malaria during the war and in ordinary tropical practice. Observations on over 2000 cases of malaria at the Liverpool School of Tropical Medicine during the war showed that, whatever the treatment administered, the vast majority relapsed within a month of its cessation. The difference cannot be explained on the obvious hypothesis that the cases of induced malaria were syphilitics, as some of them were non-syphilitic cases of dementia præcox, encephalitis, and disseminated sclerosis, and all responded to quinine treatment in the same way.

Factors Influencing Relapses.

The question now arises what is it that determines whether, or when, a relapse will occur? An exhaustive examination of the factors which might influence the occurrence of relapses showed clearly: (1) That provided a certain minimal dose (20–30 gr.) of quinine was given for two or three days, the amount of the drug administered exercises no influence. (2) That the period of the year when cases are infected or treated is immaterial. (3) That the particular strain of *Plasmodium vivax* with which the patient is infected has likewise no effect. (4) That the factor which does govern the relapse question is the patient himself.

In records relating to therapy, so much attention is usually paid to questions of dosage and methods of administration of drugs, and to speculations regarding differences in virulence of strains of parasites that this all-important factor—viz., the reaction of the patient—is frequently overlooked, and failure to take it into account gives rise to incorrect interpretation and deductions. Now in what respect did these experimental cases, which were so readily controlled by quinine, differ from the war cases and those one usually encounters in tropical practice? The former were at the time of treatment all primary infections, whereas the latter were old-standing relapse cases; and this, I believe, is the true explanation of the difference in their reaction to therapy.

Mechanism of Cure in Malaria.

This brings us to a consideration of the mechanism whereby a cure is obtained in malaria. As a result of much work on this subject Macfie and I advanced the following hypothesis. Quinine given to a patient whose blood contains numerous malaria parasites invariably destroys directly, or more probably indirectly, large numbers, but not all, of the parasites, thus setting free a considerable quantity of soluble antigen. The antigen provokes by stimulation of the host's tissues the formation of immune body. The immune body, if present in sufficient amount, destroys the remaining parasites, thus resulting in sterilisation of the infection and in cure of the patient.

As will be seen, this hypothesis embodies two postulates; firstly, that no form of quinine therapy ever destroys all the malaria parasites in the human body; and secondly, that the tissues of the host are able, in response to antigen stimulus, to produce a sufficient quantity of immune body. We have been able to accumulate a considerable mass of evidence indicating the correctness of these postulates; this has been considered elsewhere (Yorke and Macfie, 1924, and Yorke, 1925), and I need not deal with it here.

Of late years evidence has been forthcoming that a number of drugs, which are of the utmost value in the treatment of specific diseases, have themselves little or no action on the parasites which produce the diseases. For example, atoxyl is known to be of the utmost use in the treatment of sleeping sickness and quickly causes the parasites to disappear from the blood of an infected man or animal, yet, if mixed with the parasites in a test-tube, the drug has no action on them; if, however, atoxyl is treated with fresh extract of liver, it speedily becomes parasiticidal (Levaditi). Again, it has long been known that fresh human serum will cure mice infected with sleeping sickness, whereas it has no action on the parasites in the test-tube; the explanation is that the serum reacts with the reticulo-endothelial system of the mouse and the product is parasiticidal; Rosenthal and Freund have shown that if the reticulo-endothelial system of the mouse be put out of action by splenectomy and other measures, then the injection of human serum is useless. Finally, if quinine be incubated for some hours with malarial parasites the parasites are not killed, because the mixture when injected into a patient produces infection.

Although, then, the experimental proof is still lacking, it seems highly probable that quinine, when introduced into the human body, is in some way changed into an active substance, and that certain body-cells play an important part in causing the dis-

appearance of malaria parasites from the blood which follows quinine administration. This process does not, however, result in sterilisation of the infection; most of the parasites are destroyed, but some remain and they exist in the human body for long periods without increasing sufficiently in number to appear in the peripheral blood. They are held in check by immune body and a state of balance or tolerance results. This state of balance ends in one of two ways: either the infection dies out and a cure is obtained, or it re-establishes itself and a relapse occurs; which alternative results is dependent entirely on the host and any factor which tends to lessen the capacity of the host to form immune-body assists in the production of a relapse. What these factors are we can only speculate, but there may well be deficient nutrition, ill-health due to extraneous causes, exhaustion and strain, repeated infection, and lastly, and possibly not least, over-dosing with quinine.

Evils of Over-Administration of Quinine.

Having regard to the fact that the action of many drugs is indirect—i.e., they must react with the body-cells before they are capable of destroying the parasites—it is at once apparent that there may be very definite ill-results from the over-administration of the drug. Experience in the war showed clearly the impossibility of sterilising a malarial infection merely by raising the dose of the drug; such enormous daily doses as 90 or 120 gr.—doses which border on the toxic—were futile, as also were such courses as 45 gr. daily for two months and 30 gr. daily for four months. Within a week or two of the cessation of treatment a relapse occurred, and frequently, as a matter of fact, even whilst the patient was taking these large doses of quinine. Furthermore, there is evidence that no good results from the administration of quinine when the blood is negative; and I have already referred to the experimental work conducted by Macfie and myself which showed that quinine has no true prophylactic action in that even such large doses as 30 gr. for three days fail to destroy the sporozoites which the mosquito injects.

Turning now from this brief summary of certain of the limitations of quinine, let us consider for a moment the manner in which excessive quininisation may be detrimental. Apart altogether from the fact that prolonged administration, or very large doses, of quinine upset the digestion and nervous system of many persons and thereby lessen the general resistance, there is possibly a much more directly pernicious effect of such a procedure. Let me refer once more to the fact that human serum cures mice infected with sleeping sickness and recall that this is due to the formation of a parasiticidal substance produced by the interaction of the serum and the reticulo-endothelium of the mouse. Now it has been shown by Rosenthal and Freund (1923 and 1924) that repeated injection of human serum into mice inhibits the protective action of a dose of the serum administered later, after the mouse has been infected with trypanosomes; this has been proved to be the result of an exhaustion phenomenon, the repeated doses of serum wearing down the reticulo-endothelial system, so that it finally ceases to react with the serum to produce the parasiticidal substance.

Is it not likewise possible that in the treatment of malaria also there may be a danger from excessive doses, or from the prolonged administration, of quinine, of exhausting the body-cells which react with the drug to form the parasiticidal substance; and may not excessive quininisation be one of the factors which rendered the war cases and the majority of cases of malaria one encounters in private practice so difficult to cure?

CONCLUSION.

In conclusion, may I express the hope that I have succeeded in showing that this interesting reaction of one disease upon another has thus a two-fold effect in that "it blesseth him that gives and him that takes." A not inconsiderable proportion of the paretics are restored to health, and those who suffer from malaria will doubtless in due course benefit from the advance of knowledge which the remarkable influence of this infection on the nervous disease alone has made possible.

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A NOTE ON FIFTEEN CASES OF OPERABLE CARCINOMA OF THE BREAST TREATED BY RADIUM AND X RAYS.*

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IT is not suggested in this paper that radiation should be preferred to operation in operable cases of breast cancer; radiation treatment is still too much in the experimental stage in its application to malignant disease, and its results are still too little known for this attitude to be adopted. At the same time radiation, which has sometimes led to the complete disappearance of inoperable growths and recurrences, should give very good results in operable cases, and radiologists therefore ought to study and discuss the problems of the treatment of operable breast cancer, for they never know when an operable case may be referred to them for some special reason.

A vast amount of attention, time, and money is devoted in every radiotherapeutical clinic to the treatment of inoperable primary or recurrent malignant disease, for which for the most part palliation is the only reasonable aim; but when an operable case is referred there is as yet no unanimity as to the best method of dealing with such a case, nor is there accurate knowledge as to the results of the different X ray and radium techniques which may be employed. And yet here it is not the degree of palliation, but *cure* (as far as the word can be used in speaking of malignant disease) which hangs in the balance for the patient. The responsibility is therefore great on the radiologist in dealing with such cases, for clinical cure should result in a high proportion—in nearly every case indeed, unless there is already distant metastasis, or some as yet unknown biochemical factor reducing the natural immunity, as there appears to be in patients who develop cancer during pregnancy.

In the following series every patient either refused operation, or else age, chronic bronchitis, heart disease, or glycosuria made operation inadvisable.

* Read before the First International Congress of Radiology, London, 1925.

infective mosquitoes, and the observations on malaria which I am about to summarise were made on these cases which are, of course, strictly comparable with the infections which occur in Nature.

Even up to the present time a number of authors, more particularly the French, still adhere to the view that there is only a single species of malaria parasite found in man; evidence was, however, adduced during this work which in our opinion renders the unicity hypothesis of the malaria parasites of man untenable.

The incubation period of simple tertian malaria in man was shown to vary considerably, the first rise of temperature occurring in from 9 to 22 days after the bites of infective mosquitoes and parasites appeared in the peripheral blood for the first time in from 13 to 21 days. Another interesting observation was that although the first parasites to appear in the peripheral blood were almost invariably trophozoites, in all cases gametocytes (forms which are capable of infecting mosquitoes) made their appearance two or three days later.

Action of Quinine.

Of much greater practical interest, however, are the observations which we have been able to make regarding the action of quinine in the cases of mosquito-induced malaria. Our inquiry followed two directions, firstly, to ascertain whether quinine given prophylactically prevented the development of malaria; and secondly, to examine the therapeutic action of the drug and determine whether the mosquito-induced malaria was as easily cured by a short course of the drug as are the inoculated cases, or whether they subsequently relapsed with the same regularity as did the war cases and the majority of cases in tropical practice.

Numerous observations showed that quinine has no true prophylactic action in malaria, the administration of such doses as 10 gr. in solution daily for five days before, the day of, and for eight days after the bite of infective mosquitoes failed to prevent the development of malaria, the patients developing fever and showing parasites in the blood in about the usual time; similar results were obtained in cases where 30 gr. of the drug in solution were given on the day of feeding infective mosquitoes and on each of the two following days. These experiments showed conclusively that quinine has no action on the sporozoites (infective germs) injected by the mosquito, and consequently that the drug has no true prophylactive action. When, however, the daily dose of quinine is continued for ten or more days after the meal of infective mosquitoes, the infection does not develop.

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These results are in striking contrast to those obtained in the treatment of malaria during the war and in ordinary tropical practice. Observations on over 2000 cases of malaria at the Liverpool School of Tropical Medicine during the war showed that, whatever the treatment administered, the vast majority relapsed within a month of its cessation. The difference cannot be explained on the obvious hypothesis that the cases of induced malaria were syphilitics, as some of them were non-syphilitic cases of dementia præcox, encephalitis, and disseminated sclerosis, and all responded to quinine treatment in the same way.

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The question now arises what is it that determines whether, or when, a relapse will occur? An exhaustive examination of the factors which might influence the occurrence of relapses showed clearly: (1) That provided a certain minimal dose (20–30 gr.) of quinine was given for two or three days, the amount of the drug administered exercises no influence. (2) That the period of the year when cases are infected or treated is immaterial. (3) That the particular strain of *Plasmodium vivax* with which the patient is infected has likewise no effect. (4) That the factor which does govern the relapse question is the patient himself.

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As will be seen, this hypothesis embodies two postulates; firstly, that no form of quinine therapy ever destroys all the malaria parasites in the human body; and secondly, that the tissues of the host are able, in response to antigen stimulus, to produce a sufficient quantity of immune body. We have been able to accumulate a considerable mass of evidence indicating the correctness of these postulates; this has been considered elsewhere (Yorke and Macfie, 1924, and Yorke, 1925), and I need not deal with it here.

Of late years evidence has been forthcoming that a number of drugs, which are of the utmost value in the treatment of specific diseases, have themselves little or no action on the parasites which produce the diseases. For example, atoxyl is known to be of the utmost use in the treatment of sleeping sickness and quickly causes the parasites to disappear from the blood of an infected man or animal, yet, if mixed with the parasites in a test-tube, the drug has no action on them; if, however, atoxyl is treated with fresh extract of liver, it speedily becomes parasiticidal (Levaditi). Again, it has long been known that fresh human serum will cure mice infected with sleeping sickness, whereas it has no action on the parasites in the test-tube; the explanation is that the serum reacts with the reticulo-endothelial system of the mouse and the product is parasiticidal; Rosenthal and Freund have shown that if the reticulo-endothelial system of the mouse be put out of action by splenectomy and other measures, then the injection of human serum is useless. Finally, if quinine be incubated for some hours with malarial parasites the parasites are not killed, because the mixture when injected into a patient produces infection.

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appearance of malaria parasites from the blood which follows quinine administration. This process does not, however, result in sterilisation of the infection; most of the parasites are destroyed, but some remain and they exist in the human body for long periods without increasing sufficiently in number to appear in the peripheral blood. They are held in check by immune body and a state of balance or tolerance results. This state of balance ends in one of two ways: either the infection dies out and a cure is obtained, or it re-establishes itself and a relapse occurs; which alternative results is dependent entirely on the host and any factor which tends to lessen the capacity of the host to form immune-body assists in the production of a relapse. What these factors are we can only speculate, but there may well be deficient nutrition, ill-health due to extraneous causes, exhaustion and strain, repeated infection, and lastly, and possibly not least, over-dosing with quinine.

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Having regard to the fact that the action of many drugs is indirect—i.e., they must react with the body-cells before they are capable of destroying the parasites—it is at once apparent that there may be very definite ill-results from the over-administration of the drug. Experience in the war showed clearly the impossibility of sterilising a malarial infection merely by raising the dose of the drug; such enormous daily doses as 90 or 120 gr.—doses which border on the toxic—were futile, as also were such courses as 45 gr. daily for two months and 30 gr. daily for four months. Within a week or two of the cessation of treatment a relapse occurred, and frequently, as a matter of fact, even whilst the patient was taking these large doses of quinine. Furthermore, there is evidence that no good results from the administration of quinine when the blood is negative; and I have already referred to the experimental work conducted by Macfie and myself which showed that quinine has no true prophylactic action in that even such large doses as 30 gr. for three days fail to destroy the sporozoites which the mosquito injects.

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Is it not likewise possible that in the treatment of malaria also there may be a danger from excessive doses, or from the prolonged administration, of quinine, of exhausting the body-cells which react with the drug to form the parasiticidal substance; and may not excessive quininisation be one of the factors which rendered the war cases and the majority of cases of malaria one encounters in private practice so difficult to cure?

CONCLUSION.

In conclusion, may I express the hope that I have succeeded in showing that this interesting reaction of one disease upon another has thus a two-fold effect in that "it blesseth him that gives and him that takes." A not inconsiderable proportion of the paretics are restored to health, and those who suffer from malaria will doubtless in due course benefit from the advance of knowledge which the remarkable influence of this infection on the nervous disease alone has made possible.

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A NOTE ON FIFTEEN CASES OF OPERABLE CARCINOMA OF THE BREAST TREATED BY RADIUM AND X RAYS.*

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IT is not suggested in this paper that radiation should be preferred to operation in operable cases of breast cancer; radiation treatment is still too much in the experimental stage in its application to malignant disease, and its results are still too little known for this attitude to be adopted. At the same time radiation, which has sometimes led to the complete disappearance of inoperable growths and recurrences, should give very good results in operable cases, and radiologists therefore ought to study and discuss the problems of the treatment of operable breast cancer, for they never know when an operable case may be referred to them for some special reason.

A vast amount of attention, time, and money is devoted in every radiotherapeutical clinic to the treatment of inoperable primary or recurrent malignant disease, for which for the most part palliation is the only reasonable aim; but when an operable case is referred there is as yet no unanimity as to the best method of dealing with such a case, nor is there accurate knowledge as to the results of the different X ray and radium techniques which may be employed. And yet here it is not the degree of palliation, but *cure* (as far as the word can be used in speaking of malignant disease) which hangs in the balance for the patient. The responsibility is therefore great on the radiologist in dealing with such cases, for clinical cure should result in a high proportion—in nearly every case indeed, unless there is already distant metastasis, or some as yet unknown biochemical factor reducing the natural immunity, as there appears to be in patients who develop cancer during pregnancy.

In the following series every patient either refused operation, or else age, chronic bronchitis, heart disease, or glycosuria made operation inadvisable.

* Read before the First International Congress of Radiology, London, 1925.

The interim results suggest that such patients should be more freely offered the alternative of radiation treatment than they are at present; at least they should not be told that there is no alternative to operation.

X Ray Cases (8).

CASE 1.—Mrs. S., aged 82. This patient had been successfully brought through a double apical pneumonia two years previously by her medical man, Dr. F. W. Rix. A mass appeared in her right breast, in the upper and outer quadrant, and she was seen by a surgeon, who advised that operation was the only course to be considered. The patient's son, however, was a medical man, and he and Dr. Rix, considering the patient's age, her history of pneumonia and chronic bronchitis, and her bad heart, consulted Sir William Willcox and the late Sir James Galloway, who both advised strongly against operation. The patient was brought to one of us (J. H. D. W.), and deep X ray treatment was given (May, 1922). The mass was hard, 6 by 8 cm. in size, adherent to the pectoral muscle. On July 11th the mass could hardly be felt. On Oct. 3rd the small soft residue was treated again. The general condition was good. In December she suddenly fell ill with broncho-pneumonia in both bases, and died after only a few days' illness. The opinion of those in medical attendance was that this terminal illness was in no way connected with the previous breast condition.

CASE 2.—Mrs. S. S., aged 55. This patient came into the Middlesex Hospital under Mr. Sampson Handley. There was a stony hard mass in the axillary tail on the left side 10 by 7 cm. in size. Treatment was given in February, 1925, and in April, by which time the mass was much smaller, and again in May. On June 24th Mr. Handley saw the patient and noted that the mass had apparently disappeared. The skin is still puckered in and adherent at the site where the mass was. The patient feels and looks in much better health than she was when first seen in February. This is a new case, but the immediate result has been very good.

CASE 3.—J. S., aged 75. This patient came with a four months' history to Mr. Handley. She refused operation, and Mr. Handley advised X rays. She had an "atrophic scirrhus, deep pucker of skin, slight underlying induration; no glands" (from Mr. Handley's note, Feb. 19th, 1919) in the lower inner quadrant of the left breast. She had attended irregularly for some time before this for low voltage X ray treatment, then had no X rays for nearly four years. In December, 1923, the residue was slightly adherent to deeper structures, and she had more X ray treatment. In November, 1924, the left axillary glands were enlarged; after treatment they were no longer palpable in January. Seen again at intervals, she remains in a satisfactory local and general state, with no more treatment. (*See notes at end.*)

CASE 4.—E. E., aged 77. She came to hospital under Mr. Handley giving a three years' history. She refused operation. She had a hard mass in the left breast adherent both to skin and muscle, with peau d'orange appearance of the lower breast; there was a hard gland in the left axilla. She had high voltage treatments in July and September, 1924, and January, 1925. The residue appears to be quiescent.

CASE 5.—Mrs. G., aged 78. This patient refused operation. The left nipple was drawn up compared with the opposite side. There was a hard localised mass 6 by 6 cm. in size, slightly adherent to the skin; no palpable glands. She was treated in June, July, September, and October, 1924, by cross-fire, high voltage. The residue now is hardly palpable, it is about 2 by 0·25 cm. in size. There has been no treatment since October, 1924, the patient reporting every three months for observation.

CASE 6.—Mrs. D., aged 71. She reported with a large hard mass 9 by 8 cm. in size in the right breast, the skin was adherent, and nipple deviated; no glands were palpable. Owing to age and chronic bronchitis, operation was inadvisable. After two deep X ray treatments in September and October, 1922, the mass was reduced to the size of 6 by 5 cm. In December, her daughter wrote to say she was in bed with a "chill." She never reported again, in spite of repeated letters. She died nearly two years and a half after last being seen, in February, 1925; the breast had become ulcerated. Treatment in this case was incomplete, the patient was debilitated, and always objected to anything being done for her; this result therefore was inconclusive.

CASE 7, Mrs. B., aged 77, and CASE 8, A. L., aged 71, are new cases. Both are improving.

Cases 9 and 10 have been treated by combined radium insertion and X ray.

CASE 9.—B. R., aged 64, had a scirrhus in the right axilla and upper outer quadrant. She refused operation. She had a preliminary X ray treatment on June 17th, 1921. Ten days after Mr. Handley inserted radium, 250 mg. (radium bromide), in five tubes for 13 hours. "The skin was involved, there was considerable infiltration of the breast, and two subcutaneous nodules." A year later, in June, 1922, "the growth was quiescent." In September there were four skin nodules, and more X ray treatment was given. Seen in March, the skin nodules had gone. Twice since then small skin nodules have appeared, and have been no longer palpable after X ray treatment. Her general condition remains good, and there are no signs of any extension beyond the right axillary fold. For four years the disease has been kept well under control.

CASE 10.—R. P., aged 48. Seen by Mr. Handley in March, 1924. There was a "lump causing deviation and retraction of the left nipple, and a hard enlarged gland in the left axilla. Diagnosis "atrophic carcinoma." Mr. G. Gordon-Taylor buried radium round the growth by the "encirclement method" Mr. Handley has described, five 50 mg. Br_2 for 18 hours, on May 17th, 1924. The axilla was treated by deep X rays in June, and a small gland appearing in the opposite axilla also had X ray treatment; the left breast and supraclavicular and left scapular areas had medium voltage X ray applications in July and August. On Sept. 30th Mr. Gordon-Taylor again buried radium round the growth and by the axilla. On Nov. 10th she was seen by Mr. Gordon-Taylor, and was "greatly improved; there was no sign of recurrence." In the last two months, however, she has developed a radium dermatitis, and is having treatment for that in the hospital at present. There is practically no sign of growth now. In both of these cases the combined use of radium insertion and X ray has been very effective. (*See notes at end.*)

The five concluding cases have been treated by radium surface applications, with radium loaned by the Medical Research Council to the Middlesex Hospital for special investigations in cancer treatment.

Radium Cases (5).

CASE 11.—F. P., aged 45. In June, 1923, there was a tumour behind the nipple with extension towards the right axilla. The mass was hard, slightly fixed to the overlying skin; there was a small gland in the right axilla. The mass measured 11 by 10 cm. Operation was refused. A prolonged series of applications with ½ g. of radium element was given, at 4 cm. distance for 33 hours, spread over six months. In March, 1924, there was practically no residue to be felt. In February, 1925, only a slight apparently fibrous thickening remained as a residue of the former tumour.

CASE 12.—H. C., aged 65. This patient had a lump about the size of a five-shilling piece in her left breast, with slight retraction of the nipple. The skin was slightly adherent, and there was a gland in the left axilla. She refused operation, and was treated with 750 mg. of radium element for five hours in September, and again in October, 1921. Later on 17 applications of ½ g. were given at three-weekly intervals, and radium treatment was also given to the left supraclavicular glands which had enlarged. In December, 1923, the tumour was only just palpable, and the supraclavicular glands were much smaller. Another treatment was given to the left breast in March, 1923. In the summer of 1923 the patient had a hemiplegia, but since her recovery from this she has come repeatedly for examination. In April, 1924, there was no definite tumour to be felt, but a diffuse thickening in the lower outer quadrant; the nipple was much retracted. Radium telangiectases were marked over the most prominent part of the breast. This patient has been followed for nearly four years, with good result.

(Any similar case would now be treated by radium cross-firing from a distance of 3–5 cm. at least, not by radium closely approximated to the skin, as in all the earlier applications in this case. Thereby the telangiectases would probably be avoided, and the base of the growth be more efficiently radiated.)

CASE 13.—M. J. K., aged 66. This patient had a hard mass in the upper and outer quadrant of the right breast; the skin was adherent. There was an enlarged gland in the right axilla. Operation, though possible, was considered inadvisable owing to the condition of the patient's heart, and she had glycosuria. Treatment began in April, 1924, by the ½ g. of radium element for eight hours at 2 cm. distance; this was repeated in May, and again in September for 14 hours. In May, a hard skin nodule 2 cm. in diameter

was found in the mid-axillary line just above the iliac crest. This nodule had radium application. On Sept. 10th neither the original tumour nor the nodule was palpable.

CASE 14.—S. M., aged 48. This patient noticed a small lump to the inner side of the nipple of the left breast in 1920. By May, 1924, it had enlarged and ulcerated through the skin. The patient had refused operation.

The nipple was retracted. The ulcerated mass was fixed to the chest wall. There were two small superficial nodules just above and to the inner side of the nipple. There was a hard gland in the left axilla. Half a gramme of radium element was applied on a dental wax applicator 2 cm. thick over the area, for a ten-hour dose divided over two days at intervals of two months four times. The axillary gland was also treated. By November the ulcer had completely healed, the growth was much smaller, and the skin nodules had disappeared. In February, 1925, 180 mg. of radium element was applied to the breast at 1 cm. distance for six hours; on this date the site of the original tumour could only be made out by very careful palpation, and the axillary gland could hardly be detected. Though the patient had refused an operation previously, strictly speaking this case was inoperable when first seen by us, unless a merely palliative operation had been carried out with post-operative radiation.

CASE 15.—M. H., aged 73. On March 4th, 1924, there was a hard mass measuring 4·5 cm. in diameter behind the nipple, fixed to the skin, but not to the chest wall. There were several skin nodules between the growth and the axilla. 400 mg. of radium were applied at a distance of 3 cm. for 18 hours in March and April, 1924, and treatment was also given in July and September, and in March, 1925. In September, 1924, the growth had become softer and smaller, and the skin nodules had disappeared. On Dec. 10th the growth was flattened, and its limits were not easy to define; a small gland was still palpable in the left axilla. On March 6th, 1925, the condition of the breast was very satisfactory, but she was found to have developed an abdominal swelling, which was diagnosed by Mr. Victor Bonney as metastatic carcinoma of the ovary following breast carcinoma.

All these five radium cases have done well locally, within the limits of the time they have been under observation. In each case there have been supplementary medium voltage X ray applications to the epigastrium, lateral chest wall and axilla, supraclavicular triangles, opposite axilla and breast.

Summarising the total 15 cases there have been two deaths, one due to an intercurrent disease, and one of the disease over two years after treatment had been discontinued; one case has an abdominal metastasis. Three are new cases, but in one of these there is now no sign of disease. One is having treatment for a radium dermatitis, the disease appearing arrested. The remaining eight have been in good general and local condition for some time. The periods of observation are too short for conclusions to be drawn as to technique or results, but the subject is brought forward because it should be discussed, and the results so far suggest that the alternative of radiation treatment can be safely offered to patients who refuse operation, or in whom operation is inadvisable.

Comparing the radium with the deep X ray cases, there is no notable difference so far in the results. The quantity of radium necessary for the thorough treatment of breast cases is so large that only a few cases can be treated with radium in any centres at present. Further supplies of radium are necessary if this country is to explore fully this method of treatment, especially as large quantities of radium, at a distance from the body, must be used in cases in whom all surgical interference is impossible, if the best results from surface radium are to be obtained.

In conclusion one point should be referred to. This is the diagnosis, in cases where there is no histological confirmation. Several writers lately have shown that a positive expert surgical diagnosis of breast cancer is correct in about 94 per cent. of cases. On this proportion one (or at most two) of this series may not have malignant disease. But practically every case showed at one time or other, in addition to characteristic signs in the primary growth, axillary or supraclavicular gland enlargement or skin nodules. And in this series no patients with mastitis and possibly very early carcinoma have been included; several cases of this nature have been treated so far with success.

Acknowledgments should be made to the Medical Research Council for their loan of radium, and to Mr. Gordon-Taylor, Mr. Eric Pearce Gould, and in particular to Mr. Handley (under whose care most of the patients were) for opportunities afforded and their interest in radiation therapy.

Notes taken on Dec. 8th, 1925.

CASE 3, with an atrophic scirrhus, in the last two years fixed to the chest wall, who had begun treatment with low-voltage X ray applications (1918–19), has reported in the last weeks with a left-sided pleural effusion.

CASE 10.—The broad sickle-shaped area in the upper and outer part of the breast, which at first appeared to be a radium dermatitis, was just *outside* the two radium encirclements; and later the area ulcerated and was evidently a malignant invasion of the skin and underlying lymphatics. Later on the left supraclavicular glands, the opposite breast, and both pleuræ became invaded, and the patient died on Oct. 9th. The two medium-voltage X ray applications and the two radium encirclements had not been sufficient to arrest the disease in the breast.

CASE 14 had a radium dermatitis after the last treatment, but has been discharged from hospital with this now healing.

CASES 2, 4, 5, 7, 8, 9, 11, 12, 13, and 14 are well, with little or no sign of disease.

THE STANDARDISATION OF TUBERCULIN AND THE PRECIPITIN TEST.

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THE testing of tuberculin by methods based on the official test in use at Frankfort has been carried on in England for many years. Eagleton and Baxter (1923) used the official Frankfort method, in which varying doses of tuberculin are injected subcutaneously into different tuberculous guinea-pigs until the lethal dose is found; they added the von Pirquet and intracutaneous tests and thereby considerably improved the method.

With the methods at present available the degree of accuracy attainable is of a different order from that ordinarily obtained in the testing of diphtheria and tetanus toxins and their antitoxic sera, which lend themselves to accurate titration, but the test nevertheless distinguishes at least a "satisfactory" from a "useless" tuberculin. It is probable that an experienced worker can differentiate, on a short range of tests, between three tuberculins of values 100 per cent.—i.e., equal to standard tuberculin—60 and 30 per cent.; on a long range of tests smaller differences probably can be detected.

The standard tuberculins used in the work in England have been based upon those of Frankfort since the receipt of the first standard from Ehrlich several years before the war, and many different batches of tuberculous guinea-pigs have been used with fairly consistent results.

Dreyer and Vollum (1924) described a precipitin test and found that considerable discrepancies might exist between the results obtained by the guinea-pig

method and the precipitin test. Table I. summarises these results.

TABLE I.

A = Description in Table VII. (Dreyer and Vollum, 1924).
B = Value by precipitin test (Dreyer and Vollum).
C = Value by guinea-pig test (Okell and Parish).

A.	B.	C.	A.	B.	C.
British 3	33·2	100	British 2	135·1	100
„ 4	46·0	100	„ 8	119·6	100
„ 5	244·7	100	„ 9	95·2	100
American 29 ..	131·3	10	„ 12	117·8	100
Belgian 30 ..	19·8	5	„ 26	6·4	10
			American 27 ..	14·8	10
			„ 28 ..	29·6	20
			French 31.. ..	18·3	10

It therefore became of fundamental importance to discover whether tuberculins found to be equal (within the error of the test) to standard by the official Frankfort test on guinea-pigs could vary widely in their content of the active principles of "tuberculin," the substance used for the detection of tuberculosis in man and animals. A joint investigation was therefore arranged. It was agreed that one of the workers at the Wellcome Physiological Research Laboratories should choose from materials available at the laboratories three tuberculins, and should hand them to the various workers, each of whom would know nothing of the value of the tuberculins or of results obtained by the other workers until he had made his final report.

The three tuberculins were 1366, a Koch's old tuberculin made on the ordinary glycerine veal broth medium, 1360, and 1232. These two latter had been made in the ordinary way from strains of *B. tuberculosis* grown as a film on glycerine veal broth in the expectation that good tuberculin would result. When the filtrates had been concentrated and batches of the desired Koch's old tuberculin had resulted, the "tuberculin" failed to pass the ordinary animal test. Further examination by the various guinea-pig tests indicated that the "tuberculin" values of these two batches were very low—approximately 2 to 5 per cent. and 5 to 10 per cent.

In order that the various workers should use the same technique, Dreyer and Vollum arranged a full demonstration of the details of the precipitin test at Oxford. This enabled Okell, with the help of Miss G. I. Steed, to carry out three precipitin tests on the three tuberculins. These latter workers with their limited experience of this test would not attach undue importance to the accuracy of their figures obtained by the precipitin method. However, in their three tests they always placed the three tuberculins in the same order of merit (Col. 7) as Dreyer and Vollum (Col. 6, Table II.).

Cummins carried out the testing of the three tuberculins on a number of patients. He decided to test out these tuberculins in a series of dilutions as formerly suggested by Dreyer and according to the technique described by himself (1924). This same technique was used by Dreyer and Vollum in the "human cutaneous test" described in their paper. Twenty patients affected with various forms of tuberculosis, and suitable controls, were used in the investigation. An examination of the records of the local reactions led Cummins to report before he had any further details relating to the tuberculins, that "1366 is a very efficient preparation, superior in every way to 1360 and 1232. The two latter samples are indeed so poor in reaction value as to be useless and misleading for clinical purposes."

Buxton tested the three tuberculins on tuberculous cows in various dilutions by the "repeat intradermic test" (as described by himself (1925)). His conclusions are given in Col. 5 of Table II.

The results of the joint investigation are given in Table II. It will be seen that the official Frankfort or "guinea-pig" method, the intracutaneous and von Pirquet tests in guinea-pigs, the cutaneous method in human beings, and the intracutaneous test on tuberculous cows all agreed in indicating that 1366 was a satisfactory tuberculin, and that 1360 and 1232 were practically worthless, while the precipitin method suggested that if 1232 was a tuberculin of precipitin value 100, 1366 had a value of only 12 and 1360 of 50.

With reference to the precipitin method, the results of Mueller (1925) and of Laidlaw (1925) indicate that the active principle of "tuberculin" and the substances precipitable by an antiserum, are probably two distinct substances, separable by chemical methods.

TABLE II.

Col. 1.	Col. 2.	Col. 3.	Col. 4.	Col. 5.	Col. 6.	Col. 7.
Tuberculins.	Original values (Okell and Parish).	Parish.	Cummins.	Buxton.	Dreyer and Vollum.	Okell and Miss Steed.
	T.B. guinea-pigs, subcutaneous, von Pirquet and intracutaneous.		Human patients: cutaneous test.	Tuberculous cows: intradermic test.	Flocculation test.	
1232	5–10	About 5.	Both weak and inefficient.	Poor.	100	100
1360	2½–5	About 2½.		Useless.	59	50
1366	100 = Frankfort standard.	100	Thoroughly reliable; powerful tuberculin.	Full potency.	14	12

Col. 1.—The original batch numbers of the tuberculins.
Col. 2.—These values were, prior to the present joint investigation, given by Okell and Parish as the results of many tests by the subcutaneous, intradermic, and von Pirquet methods applied on many occasions over a period of about 18 months. The values obtained by the three methods on the tuberculous guinea-pig agree fairly closely.

Col. 7.—Precipitin tests by Okell and Miss Steed. Vollum provided a generous supply of the precipitating serum. Okell and Miss Steed report "on precipitin test 1232 markedly better than 1360 or 1366. 1360 is definitely better than 1366." The arbitrary values given are the averages of two series of readings amongst which rather wide fluctuations occurred. These figures correspond fairly closely to those in Col. 6.

Summary.

1. The precipitin test does not necessarily measure the active principle of tuberculin on which its use in the various methods of diagnosis of tuberculosis depends.

2. Satisfactory agreement in precipitin unit value was obtained by two different groups of workers by the precipitin test. This test apparently measures with a considerable degree of accuracy a substance probably other than the active principle of tuberculin, and presumably the interesting precipitable substance of Mueller and Laidlaw.

3. The "tuberculin" value of tuberculins which have been standardised by the official Frankfort method cannot in all cases be deduced from the precipitin test.

4. The results obtained by subcutaneous, intracutaneous, and von Pirquet tests on guinea-pigs and by the tests on tuberculous human beings and cows were in agreement. By these three methods a tuberculin of standard strength and two others of values approximately 10 and 5 per cent. of standard were placed correctly in order of merit.

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THE DIAGNOSIS AND TREATMENT OF INTRATHORACIC NEW GROWTHS.

Opening a Discussion at the Royal Society of Medicine on Feb. 23rd.

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A FEW years ago a discussion on intrathoracic new growths would have been of academic interest only. An uncommon condition but rarely diagnosed, at any rate until the very late stages, and when diagnosed untreatable. The condition, however, is not so rare as was supposed, and with improved methods of diagnosis many cases are now recognised which formerly would have been considered to have been cases of some other disease—usually tuberculosis. These tumours may be considered under three headings: (1) those of the mediastinum; (2) those of the pleura; (3) those of the lung. In all cases the growth may be primary or secondary, malignant or benign. In the case of secondary tumours the diagnosis is, as a rule, easy, but they are generally beyond cure. A primary growth, however, may often be successfully removed by operation, even if malignant. The benign tumours especially lend themselves to successful operation, and as these usually increase in size and eventually prove fatal, it is very important to deal with them in the early stages.

Tumours of the Mediastinum.

Sarcoma is the most common primary growth, but a secondary carcinoma is frequently found. Of the non-malignant cases fibroma and dermoid are the least uncommon. Sometimes the tumour grows very rapidly, so that even after a few weeks the whole chest may be a mass of new growth. In the late stages, of course, the diagnosis is obvious. In the early stage the first sign is the result of pressure. Some time ago I saw a man who complained of swelling of the veins of the right side of the neck when he stooped; otherwise he was quite well. I could find no physical signs but suspected mediastinal tumour from the symptom, and X rays showed a mass in the superior mediastinum. He had a course of X ray therapy, but the tumour spread and he died seven months after the first symptom. Post mortem he was found to have an enormous sarcoma in the mediastinum involving most of the right lung and the pericardium, with secondary masses in the left lung. In this case the diagnosis was made early, and I much regret that I did not consult a surgeon.

In a second case the patient complained of swelling of most of the joints, was unable to walk, and was wheeled into the hospital as a case of rheumatism. He denied cough or any chest symptom, but as his fingers were very clubbed I suspected an intrathoracic lesion, and on examination found dullness between the scapulæ and a very obvious D'Espine sign. X rays showed a large mediastinal mass. After treatment with X rays this mass disappeared and all the joint symptoms cleared up though the clubbing remained. He kept well for about a year, when glands appeared in the groins and were found to be lymphadenomatous. In this case the growth had reached such a size that it could readily be recognised by clinical examination, before any symptoms except the arthropathy had appeared. In the first case the pressure signs came before any physical signs could be detected. In both cases, however, X rays confirmed the diagnosis. Pleural effusion usually appears early in these cases, but not as a rule until other signs have been noticed. Dyspnœa and pain are also early symptoms, but may be absent until the late stages. There is, indeed, no early sign or symptom which is constant, but one should always be on the look-out, and the slightest symptom suggesting pressure in the mediastinum should make one very suspicious. Having made the diagnosis it is important to exclude syphilis or aneurysm as the cause, and if these can be excluded I think a surgeon should be called in as soon as possible.

Tumours of the Pleura.

The type most frequently seen here is endothelioma. Usually the first symptom is dyspnœa, which is found to result from a large pleural effusion. I saw a case last year in a youth of 20. He suddenly developed what was thought to be a bad cold and went to bed owing to increasing dyspnœa. Pleural effusion was found and was aspirated many times, but the fluid always re-formed rapidly and he died six months after the onset of the first symptom. In this case the diagnosis was made (and it was confirmed at the post mortem) solely on the quantity of the fluid and the rapidity with which it formed. The fluid was clear throughout in this case, but usually it becomes blood-stained sooner or later. On the other hand, I have frequently seen a blood-stained effusion which was not caused by neoplasm. It is often blood-stained in cases of tuberculosis.

Tumours of the Lung.

Primary carcinoma of lung occurs in about 1 per cent. of all cases of carcinoma. It is said that tuberculosis is a predisposing cause, and certainly this disease is often present in cases of carcinoma of lung. Moreover, in 80 per cent. of cases the upper lobe is involved, so that the diagnosis may be of the greatest difficulty, especially if tubercle bacilli are present in the sputum. If a diagnosis is made early enough carcinoma of lung may be, and has been, successfully treated by operation. In order to arrive at an early diagnosis it is important to be on the look-out for neoplasm; many cases are missed because they are never suspected. Secondly, one should rid oneself of the old fallacy that the absence of tubercle bacilli in the sputum means nothing. In any case of pulmonary disease where there is sputum repeated failure to find tubercle bacilli should lead one to suspect—and very strongly—that the disease may not be one of pulmonary tuberculosis even if the signs are definite and confined to the apex of a lung. Thirdly, whenever the signs or symptoms are unusual, neoplasm should be suspected. It should not be forgotten that in some 90 per cent. of cases the disease starts in a bronchus. Bronchoscopy, therefore, is of the greatest value in the early recognition of these growths. Not only is it sometimes possible to see the growth, but a suspicious piece of the bronchial mucosa may be removed for microscopical examination. To illustrate some points in diagnosis I will give a brief account of a case of carcinoma of lung that I saw recently. A woman of 55 had been ailing for 18 months, and since influenza five months ago had been worse. She had lost 2 st. in weight, had night sweats, and a cough with purulent blood-stained sputum. She had been advised to go into a sanatorium several months before but had refused. Now, however, finding herself worse she had consented, and it was with a view to arranging sanatorium treatment that she came to me. On examination I found that the signs were confined to the left lung. In front from the clavicle to the third space crepitations were heard, the breath sounds were bronchial, and the percussion note impaired. Below this until the fifth space the breath sounds were absent and the percussion note stony dull. Now the history was quite typical of tuberculosis, but there were two facts which made the diagnosis doubtful. The first that tubercle bacilli had never been found in the sputum, and the second the signs, although at the apex, were not those usually found in tuberculosis. The patient was therefore admitted to hospital and the X rays showed a definite dense round shadow in the middle of the left lung. This mass was clearly a tumour, and it was important to decide whether it was in the lung tissue or not. Some lipiodol was injected into the trachea with the patient lying on the left side, and the X ray photograph showed the left bronchus well defined for a short distance, when it suddenly stops. It could also be seen that the lipiodol had overflowed into the normal right bronchial tree. So far the case appeared to be one of carcinoma of lung with occlusion of the bronchus.

An artificial pneumothorax was induced, and it was found that the lung collapsed around the mass, as is seen in the next X ray. Examination with the thoracoscope showed the presence of a large neoplasm in the lung tissue. Owing to the size of the growth, the length of history, and the bad general condition of the patient it was decided not to advise an operation. The patient died shortly afterwards, and at the post-mortem there was found a large carcinoma of lung with occlusion of a large bronchus, as was shown so well after the injection of the lipiodol. Just before death she developed a secondary growth of brain—not an uncommon site in these cases. I did not have a bronchoscopic examination because the diagnosis was clear without one, but had the condition been suspected a year earlier the growth would probably have been detected by the bronchoscope and she might have been saved by operation.

I have been able to do little more than touch upon my subject from the physician's point of view. Mr. J. E. H. Roberts is to speak after me, and I have left it to him to discuss the surgical methods and the chances of life they offer to the patients (see p. 468). As a physician, however, I must emphasise the fact that however dangerous an operation may be it is our duty to weigh this danger against the danger of leaving the patient alone, which in almost all of these cases is certain death. Operation cannot hope to succeed when metastases have appeared, and they start early. I should say, then, lose no time in confirming your diagnosis, and when once it is confirmed call in a surgeon and do not waste time in giving a trial to radium or any other form of treatment. Moreover, remember that non-malignant growths such as a dermoid or fibroma often prove fatal if left too long. I have laid stress on the value of X rays in diagnosis and have pointed out how the introduction of lipiodol or the induction of a pneumothorax may assist the X rays, but I have left it to Dr. Stanley Melville to describe this part of the subject in detail, and especially as regards treatment. In my experience X ray therapy is very good in cases of lymphadenoma and sarcoma and should always be used. For other forms of intrathoracic growth I have found X rays and radium therapy disappointing, but they should be tried in cases which are inoperable. When operation is possible it should be tried first. With regard to drugs, except in the case of gumma (and I have warned you that syphilis must be excluded before coming to a final diagnosis) they are of value only to alleviate symptoms.

In these cases the great function of the physician is to make an early diagnosis, and for this purpose I should say the most important factors are to suspect the unusual in every case of chest disease and not to rest satisfied with a diagnosis, however probable, until it is absolutely confirmed after a complete examination.

CASE OF
RUPTURE OF THE THORACIC AORTA.

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With Post-mortem Notes by

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RUPTURE of the aorta through an atheromatous plaque, though an uncommon, is by no means a previously unknown event. As in the case here recorded, death does not as a rule follow immediately upon the rupture. The interval of a few days between the symptoms due to the primary outrush of blood and the second set of symptoms just before death, due to the spread of the hæmorrhage, is usual. In most of the recorded cases the blood in the second and fatal hæmorrhage had reached the pericardial sac; for it to pass between the pleura and the chest wall as in this case would appear to be excessively rare. At any rate no record of this phenomenon has been found in the literature available.

Clinical History.

T. C., a man, aged 51, was admitted to hospital on Sept. 18th, 1925. He had been in perfect health till some six months previously, doing heavy work in a corn mill till 1916, serving in France from 1916 till 1919, and working as a motor-lorry driver since. He had been receiving treatment from his private doctor for the last six months, at first for bronchitis, but latterly for symptoms of gastric origin—anorexia, especially for fats, chronic abdominal pain, and vomiting after meals. A tentative diagnosis of carcinoma of the stomach had been made, and a barium meal was given at the beginning of August, but revealed nothing abnormal. On Sept. 17th, 1925, while driving his lorry, he had a sudden attack of severe pain in the epigastrium, followed immediately by vomiting. He recovered sufficiently to drive his lorry home—a distance of eight miles—although the pain was increasing in severity and had spread from the epigastrium to the left scapula. He passed the night in great pain, and was admitted to hospital the next day.

Condition on Admission.—When first seen he was pale, short of breath, and very restless. Nothing abnormal could be made out in the abdomen, except for slight tenderness, and resistance to deep pressure in the epigastrium.

Heart: The heart sounds were normal. The cardiac dullness on the right extended to one inch beyond the right border of the sternum, whilst upwards and to the left its borders could not be determined, as they were continuous with the big area of dullness described below. The apex-beat, however, was clearly felt a quarter inch internal to the nipple in the fifth left interspace. It was of normal character. Pulse 112, regular, and equal on both sides. The artery wall felt somewhat thickened.

Urine: Nothing abnormal noted.

Lungs: The right lung was normal. On the left side there was a large area of absolute dullness involving roughly the upper two-thirds of the chest, back and front. In front it extended from the clavicle down to the fifth interspace, and thence it extended outwards horizontally across the axilla to the seventh rib behind. Below this area the physical signs were normal. Over the dull area the breath sounds and tactile fremitus were entirely lost.

The chest was explored in the posterior axillary line at the lower limit of the dullness and bright blood was obtained.

The pain and the restlessness both diminished rapidly after the exploration, and he was able to sit up and move about in bed without any respiratory distress. The area of dullness, however, extended until by Sept. 22nd it involved the whole of the left side of the chest, accompanied by absence of breath sounds and of tactile fremitus. The position of the right border of the heart, however, remained the same as on admission. On the 23rd the chest was screened by Dr. G. E. Dyas, who reported a marked opacity of the left side of the chest, with a slight displacement of the heart and trachea to the right. He died suddenly, with hardly any warning, on the 25th, nine days after the commencement of the illness.

The Wassermann reaction of the blood was done twice and was negative on each occasion. By the courtesy of Dr. J. Menton a Sigma test and a Kahn test were done, these also being negative.

Post-mortem Examination by S. C. DYKE.

The body was that of a well-nourished male of middle age. On opening the thoracic cavity two large extravasations of blood were apparent, both on the left side. The first of these was confined to the upper, the second to the lower part of the thoracic cavity; the upper one, although intrathoracic, was extrapleural; the second lower collection of blood was within the pleural cavity. It was apparent from the firmness of the clot and the presence of serum that the upper extrapleural collection of blood had been present for some days; the blood constituting the lower intrapleural extravasation had apparently only recently clotted and could not have been present for more than a few hours.

The upper collection of blood had apparently come from the neighbourhood of the great vessels at the base of the heart and had attained its extrapleural position by stripping the parietal pleura from the chest wall. The pleura had remained attached to the base of the heart, but had been stripped off the dome of the chest and the sides and back of the thoracic cavity so far down as the costal attachment of the diaphragm. The upper extrapleural collection of

blood was therefore contained in a space bounded on the inner side by the heart and the structures of the mediastinum, on its remaining sides by the walls of the thoracic cavity, and at its base by the stripped-off parietal pleura. In this stripped-off pleura, at about the level of the fourth rib, was a rent about 3 inches in length, and it was apparent that it was through this rent that the hæmorrhage giving rise to the second intrapleural collection of blood had taken place. This rent had presumably originated in the puncture of the stripped-off pleura by the exploring needle on the previous day. The presence of the two hæmorrhages had served to collapse the left lung, to push the heart slightly over to the right side, and to thrust down the dome of the diaphragm on the left side.

On opening the pericardial sac no contained blood was found. The heart was large and the left ventricle showed distinct hypertrophy of the walls. Otherwise no abnormality was present. No extravasation of blood was present in the tissues of the anterior mediastinum, but on removing the heart and lungs it was apparent that blood had found its way generally throughout the posterior mediastinum, more particularly in its upper part; this blood was for the most part lying in the areolar tissue supporting the various structures. The most intense degree of extravasation had occurred into the walls of the aorta, the blood having found its way between the media and adventitia with the result that throughout the whole length of the thoracic aorta these two coats were completely separated by a lamina of blood-clot. This layer of clot was thickest in the neighbourhood of the arch, where it attained a depth of 10 mm.; from there it dwindled in thickness down to the diaphragm; the abdominal aorta was not affected.

On opening the aorta a condition of the most intense atheroma was disclosed. Numerous large calcareous plaques were present, and throughout, the intima was the subject of fatty change. On the posterior surface of the vessel just below the arch was a linear tear 20 mm. in length through both intima and media, running in the long axis of the vessel. This tear, through which it was evident that the extravasation of blood had taken place, extended upwards from an atheromatous plaque, which was presumably the site at which the wall had originally given way.

With the exception of the kidneys all the other organs were apparently normal. The kidneys were small, and on section showed considerable diminution in depth of the cortex; the capsule stripped fairly readily, exposing the granular surface characteristic of "primary chronic interstitial nephritis." Histologically both kidneys showed a moderate degree of fibrosis and round-celled infiltration of the interstitial tissue; the glomeruli were entirely free from any evidence of inflammation. The smaller vessels showed to an extreme degree that fatty change of the intima universally associated with "chronic interstitial nephritis."

Comment.

In most of the recorded cases it would appear that after the primary rupture of the intima and media the spread of the hæmorrhage was limited by the adventitia, death being brought about by the later rupture of this last coat. In the case recorded above the rôle usually sustained by the adventitia alone was in part taken on by the parietal pleura which was stripped off the ribs by the hæmorrhage. It was the rupture of this membrane in this case and not, as is usual, rupture of the adventitia which was the immediate cause of death.

The atheromatous condition of the aorta in this case was apparently a part of the diffuse disease of the intima of the vasculature which is always associated with "primary chronic interstitial nephritis." It has already been pointed out that fatty change of the intima of the smaller vessels was a marked feature in microscopical sections of the kidney, and the same applied to the spleen, the only other organ examined. In "primary chronic interstitial nephritis" this fatty change of the intima of the smaller vessels of the kidney is unfailingly present; it is usually present to some extent in the aorta also, though rarely to the extent shown in this case. The cerebral vessels are also often affected, rupture of these as a result of the condition being, of course, a far commoner event than rupture of the aorta.

The absence of any history and the negative results of all the diagnostic tests may be taken as definitely excluding any syphilitic element in the case.

DIVERTICULITIS AND ITS SURGICAL TREATMENT.*

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ALTHOUGH diverticulitis is by no means a rare condition, it is only within recent years that it has been recognised and fully described, and even now it will not be found mentioned in many of the text-books on medicine. It is a condition of the latter half of life, due to the formation of small hernial protrusions from the lumen of the bowel through the muscular coat. These pouches, or diverticula, may be found in any part of the alimentary canal (except possibly the rectum), but are most common in the large intestine, and particularly in the pelvic portion.

We have to recognise two distinct conditions due to pouching of the walls of the large gut. Diverticulosis, a condition in which there are numerous small pouches or hernial protrusions in the walls of the colon, which are demonstrable by examination with a barium enema under the X rays, but which is not accompanied by any symptoms referable to the diverticula. Dr. E. I. Spriggs, at Duff House, found that 10 per cent. of the patients examined by X rays in that institution showed well-marked evidence of diverticulosis. The average age of the patients examined was 45, and they had all come to the institution for the relief of some abdominal condition, so that we can say that 10 per cent. is probably much too high a figure if applied to the generality of persons.

The other condition is that of diverticulitis, in which secondary inflammatory changes have taken place in the diverticula, and definite symptoms attributable to these changes are complained of by the patient. The great importance of detecting the condition in its earliest stages before serious inflammatory changes have taken place will be readily appreciated, and in this connexion Dr. Spriggs's valuable investigations have done a great deal to throw light on the subject. No doubt routine examinations and careful treatment will, in the future, do much to prevent the condition of diverticulosis from developing into the more serious condition of diverticulitis.

It is the latter condition which chiefly concerns us here, and I will confine my remarks chiefly to the means of dealing with it.

Of my 41 cases, 25 were men and 16 women. This agrees with Dr. Spriggs's figures for diverticulosis of 71 men and 29 women. The average age of my cases was 60, and the youngest case was 42. Dr. Spriggs suggests that the cause of the condition is the habitual use of aperients, but the fact that the condition is commoner in men than in women seems to disprove this, as there can be no doubt that the habitual use of aperients is much commoner with women.

Symptoms.

In the early stages of any abdominal disease the symptoms tend to be very vague and uncertain. Vague pain in the abdomen, discomfort, slight disturbance of the bowel actions, are all too uncertain to be of much value, though if they lead the doctor to have the colon examined by X rays may reveal the condition. The typical symptoms of a developed diverticulitis are attacks of pain and tenderness over some portion of the colon, usually the sigmoid flexure, accompanied by a slight rise of temperature. Symptoms of chronic obstruction of the bowels accompanied sometimes by the presence of a palpable tumour, felt either through the abdominal wall or per rectum by bimanual examination, may be present and will closely simulate carcinoma, but may be distinguished from it as a rule by the accompanying tenderness and signs of inflammation. The attacks may be at long intervals

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and there may be a history of difficulty with the bowels extending over a period of years. The diagnosis is often very difficult, but a bimanual examination of the pelvis will often enable a mass to be felt, and the sigmoidoscope gives useful information in some cases. A barium enema, if properly done, is of the utmost value, but only the very best X rays are of any use if the diverticula are to be seen. I am frequently having cases sent to me with X ray photographs of the colon showing nothing abnormal, and when the patient is photographed again in the proper way numerous diverticula are easily demonstrated.

To obtain proper photographs certain things are essential. The photograph must be taken instantaneously, or the movements of the colon will blur the photograph and hide the diverticula. Also, the enema should be made up with a thin medium, such as butter-milk. It is also very important that the patient should be photographed some 12 hours after the enema has been evacuated, as, while the enema is in place, only those diverticula can be seen which are situated at the edge of the bowel. After the bowel has been emptied the diverticula can be seen as opaque round objects in the line of the bowel and give rise to an appearance which is quite characteristic and unlike anything else. By far the commonest situation for the diverticula to cause trouble is in the pelvic colon. Thus, out of 41 cases of my own the distribution was as follows: sigmoid only, 36; transverse colon, 3; cæcum, 1; ascending colon, 1. Once the diverticula have formed and become full of hard fæcal material, the inflammatory changes due to the irritation of a foreign body within the thin-walled diverticulum sooner or later occur and set up secondary changes.

The tendency is for one or more of the diverticula to perforate. Perforation may occur from sloughing of a concretion through the thin wall of the diverticulum, from gangrene of the diverticulum, or from the formation of a local abscess, which subsequently bursts into the peritoneal cavity or some other viscus. The latter, in my experience, is the most usual. Perforation into the bladder is not uncommon, and I have met with three cases out of 41. An intense cystitis results with the passage of flatus and fæces per urethram.

Perforation, with the formation of local abscesses in the pelvis and one or more openings on the abdominal wall, is not uncommon. One of the great troubles of such cases is that the abscesses are nearly always multiple, and proper drainage cannot readily be established. It is rather like trying to drain a sponge. Fresh abscesses keep forming in the midst of a dense mass of hard fibrous tissue, and such cases are the cause of much anxiety and are most unsatisfactory to treat. I had one case in which there were as many as five different sinuses in the abdominal wall, all leading down to a dense mass of fibrous tissue. This condition lasted for several years, and ultimately malignant changes occurred in the skin with fatal results.

Association of Diverticula with Tumour Formation.

The greatest interest attaches to those cases in which there is tumour formation from the deposit of dense fibrous tissue around the inflamed diverticula. Such tumours often reach a considerable size, and are almost invariably fixed and adherent to other structures. These cases are frequently confused with malignant disease, and even when the surgeon is able to handle the tumour from inside the abdomen it is not always possible to be sure whether the case is one of cancer or diverticulitis. Evidence of inflammation and the presence of diverticula in other parts of the colon will help, but such evidence is not always present.

Two distinct types of tumour may be recognised from a pathological point of view. In the more usual type, on laying open the tumour there are several large diverticula containing concretions surrounded by an irregular mass of very hard fibrous tissue (see Figs. 1 and 2). In the other type, which in my experience is less usual, the tumour consists of a dense mass of cartilaginous tissue of a pale grey colour, through which can be traced numerous very narrow channels representing diverticula. These channels are so narrow that they will only admit a bristle, and large cavities are seldom seen. (Fig. 3.) The density of the cartilage in these cases is surprising, and much resembles a cartilaginous tumour, so that it is hardly surprising that many of them have been mistaken for new growths. These tumours are always adherent to others structures, and are generally situated at, or near, the middle of the sigmoid flexure. Their removal is a matter of considerable difficulty, but can often be successfully managed if their true nature is recognised. Unfortunately, they are often mistaken for malignant disease, and, of course, as such are not worth attempting to remove as they are adherent to other structures. Cases of so-called cancer of the bowel, that have recovered after a simple colostomy, are mostly accounted for in this way.

Treatment.

The surgical treatment of diverticulitis presents many serious difficulties. Naturally, it is only when serious secondary inflammatory changes have occurred that the surgeon is asked to interfere. The indications for surgical interference are in my opinion: (1) Persistent attacks of pain and tenderness in spite of careful medical treatment, the latter being directed to keeping the bowel contents liquid, and general means to improve the patient's resistance, rest, dieting, &c. (2) Attacks of threatened obstruction of the colon. (3) The presence of a palpable tumour in the colon. (4) Evidence of threatened perforation into the bladder, such as attacks of pain in the left iliac fossa accompanied by frequent and painful micturition. (5) Evidence of perforation with abscess formation or peritonitis. One of the great difficulties of dealing with these cases is that the tissues are of necessity highly septic, and that there is a danger of setting up peritonitis by breaking down adhesions in attempting to free the damaged bowel.

The ideal treatment, when the condition is localised to the middle of the sigmoid and a tumour has formed, is resection of the affected colon with end-to-end anastomosis. This is in many cases a distinctly risky procedure, but as often the only alternative is a permanent colostomy, a certain amount of risk is justifiable. The following is a good instance of such a case:—

A lady, aged 56, was sent to me with a large, hard, and very tender tumour in the sigmoid flexure, which could be felt through the abdominal wall and bimanually. A diagnosis of diverticulitis was made, and I opened the abdomen. I found a large mass in the sigmoid densely adherent to the back of the uterus and to the left Fallopian tube. I removed it with some difficulty, together with the uterus and tube, and joined the bowel end to end. A temporary cæcostomy, with a rubber tube, was established and the abdomen closed with a wick drain. The patient made an uninterrupted recovery, the cæcostomy opening closing on the twelfth day.

In another case a lady of 48 had a similar tumour, and on opening the abdomen I found that a perforation had already occurred into the left Fallopian tube, which was full of pus. The tumour was removed after evacuating the pus and the bowel joined end to end with temporary cæcostomy in the same way. This patient also recovered without any bad symptoms. In both these cases there were no evident diverticula in any other part of the colon. The specimens from both these cases are illustrated in Figs. 1 and 2.

I have, in all, resected the sigmoid for diverticulitis ten times, eight times with immediate end-to-end anastomosis and twice with colostomy. There is no doubt that resection with anastomosis gives the best results, and is the only method, once a tumour has formed, which cures the patient and leaves him in a normal condition.

The safest procedure, and that which most often has to be done, is colostomy above the site of obstruction, or perforation, as the case may be. As a rule, the colostomy opening should be established in the

transverse colon, so as to be well away from the disease and not liable to become involved in the adhesions. Occasionally, in the course of time, the condition may subside sufficiently to enable a subsequent resection to be performed, but this is not often possible. The results where a colostomy is done in time—that is to say, before the sepsis has reached too advanced a stage—are excellent. The inflammatory mischief gradually subsides and all symptoms disappear. The bowel, however, strictures up almost completely as a rule, and apart from resection there is no hope of subsequently closing the colostomy.

The obvious question that suggests itself is what possibilities are there between these two measures—resection and anastomosis and a permanent colostomy? There are several possibilities more or less satisfactory. One is to perform an ileo-sigmoidostomy, so as to short-circuit the damaged bowel. It is only in a very few cases that there is sufficient healthy bowel below the damaged portion to render this possible; also, there is a serious danger of the anastomosis becoming subsequently involved in the adhesions and inflammatory mischief around the diverticula. This happened in one of my cases, and colostomy had to be performed to relieve the condition.

Another plan, which I have carried out successfully in several cases, is to free the involved portion of bowel very carefully by breaking down the adhesions, if necessary removing any very prominent diverticulum, and to draw the damaged bowel well up on to the ileum and wrap it well up in a fold of omentum drawn down for the purpose. This prevents the inflamed bowel from becoming again adherent to the bladder or small intestine, and makes it probable that, should a local abscess or perforation occur, it will remain localised to the iliac fossa, where it can be more safely dealt with. The patients that I have treated in this way have kept well by being very careful to keep the contents of their colons absolutely liquid, and the thickening in the colon has subsided in the course of time so much that it is not now palpable. This is not, of course, a very radical method of treatment, but it has certainly saved several patients from a colostomy, and they themselves have been very pleased with the result. It is, of course, not available when obstructive symptoms have already shown themselves, and it is quite possible that some of these patients may eventually get obstruction and require colostomy.

Results.

Out of 41 cases which I have had to treat surgically, in 32 some form of radical operation was performed apart from merely opening abscesses.

	Cases.	Deaths.
Colostomy	13	0
Resection and colostomy	2	1
Resection and end-to-end anastomosis	8	2
Freeing adhesions and removal of one or more diverticula	9	1
Simple drainage and cæcostomy ..	2	0

It will be seen that by far the safest method is colostomy well away from the seat of the trouble. All these patients did well, except one who developed cancer in an old sinus and died two years later. The others all got quite well and all symptoms subsided. Some are still in good health, 10 and 11 years after operation. The objections to this operation are, of course, obvious. Of the eight cases treated by resection, two died, both from lung complications. The others have remained quite well, and there is no doubt that this is the ideal method when possible, which, unfortunately, is not often the case. Of the nine cases treated by freeing adhesions, one died from sepsis. There is always danger in these cases, even in disturbing the adhesions. The others have remained well with occasional slight attacks of pain, but up to date with no serious complications. In one case a diverticulum in the transverse colon leaked and set up general peritonitis; the patient was a lady of 70. I drained the pelvis and the perforation and performed a cæcostomy. This patient recovered. Another case was that of an elderly gentleman, who had a perforation of a diverticulum of the ascending colon and

FIG. 1.

Specimen showing numerous diverticula, some of which have been cut open, and dense fibrous tissue. This tumour was successfully resected and the patient has remained well.

FIG. 2.

Specimen of diverticulitis of the colon showing diverticula, some of which are laid open. This tumour was successfully resected.

FIG. 3.

Specimen showing dense cartilaginous thickening of the colon wall due to diverticulitis. Tumour successfully resected.

general peritonitis. He was not operated upon till four days after the perforation, but recovered with free drainage and was quite well five years later.

Summary.

Diverticulitis is a condition which, if detected in its early stages and properly treated, may be so kept in check that surgical interference will not be necessary, or may be much delayed. In its fully developed condition it is a very grave disease with most serious possibilities, and surgical interference is indicated before the more serious complications have taken place.

Operations for diverticulitis are both difficult and dangerous. Interference with the diseased bowel may easily set up grave sepsis or result in a fæcal fistula, and great care and judgment is necessary. Colostomy well away from the trouble is the safest procedure and should not be dangerous if the diseased bowel is not too thoroughly explored, or not explored at all.

Resection with end-to-end anastomosis and temporary cæcostomy is the ideal treatment, and the results I have obtained in recent years by this method have more than justified the procedure. As an alternative, wrapping the diseased bowel in omentum after freeing adhesions will give good results. When serious complications, such as local abscess, perforation into the bladder, or general peritonitis have already occurred colostomy is the only justifiable procedure.

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GLYCOSURIA IN ACROMEGALY.

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ASSISTANT IN THE MEDICAL UNIT, UNIVERSITY COLLEGE HOSPITAL.

GLYCOSURIA occurs in about 10 to 15 per cent. of acromegalics. Its exact relationship to pituitary disease is still in doubt. Ellis [1] has reported a case in which surgical removal of a pituitary tumour in an acromegalic was followed by improvement in carbohydrate metabolism. He has reviewed the current theories to account for the failure in carbohydrate metabolism, and, to fit the reported case, has supplied one of his own—that the glycosuria is related to excessive function of the intermediate lobe.

That there is some relationship between pituitary secretion and carbohydrate metabolism is undoubted, yet we must be mindful of the possibility that the glycosuria in acromegaly may be in some cases an independent condition, an essential diabetes. The question can hardly be settled by the experience of one clinician because acromegaly is relatively a rare disease, and therefore it seems desirable that the following single case be recorded as a help towards the accumulation of the necessary clinical data.

Report of Case.

A. T., male, single, aged 54, was admitted to University College Hospital on Oct. 21st, 1924. He had lived in the Argentine for 25 years. At the age of 16 enlargement of the hands, face, and jaw began, and had progressed for about five years, since when the condition had been stationary. Frequency of micturition, thirst, and debility had been present for the last three and a half years. Ten months before admission to this hospital diplopia had developed, and while in hospital in Buenos Ayres for this he had been treated for his glycosuria by dieting. Insulin was also tried, but it was said to have been without effect, and the efficacy of the insulin was doubtful. He had typhoid fever at 26 years of age. A sister had had glycosuria for three years when young but this had disappeared later. His weight had been 12 st. 9 lb. (80 kilos) for years and his height 5 ft. 10 in. since young manhood.

Condition on Admission.—Weight 11 st. 12½ lb. Systolic blood pressure 110–120 mm. Hg; temperature, 98° F.; pulse, 80.

The patient had the appearance of a typical acromegalic. The hands showed splaying out with square cut ends of the terminal phalanges. Voice deep and resonant. The tongue was large and fissured, and the lower jaw massive. Enlargement of the feet was present, but much less than that of the hands. Kyphosis was marked. X ray showed the sella turcica to be enlarged. The visual fields were normal. On ordinary ward diet the urine contained 6·6 per cent. of glucose, 230 g. in the 24 hours, with a large quantity of ketones. The glycosuria persisted after four days' starvation, only fluids being permitted, and the urine still contained 1·2 per cent. of glucose. The blood-sugar at the end of this time was 0·26 per cent. A glucose-tolerance test showed a diabetic curve. One hour and 50 minutes after ingestion of 50 g. of glucose the blood-sugar was 0·375 per cent. (its highest point), and at the end of three hours the blood-sugar was still 0·31 per cent. During the three hours 9·3 g. of glucose were excreted in the urine.

The patient was then given a diet of C. 33, P. 48, F. 77, calories 990, and the glycosuria continued for the next three days. The quantity of urine was now less than 1500 c.cm. in the 24 hours and the glucose excretion was 15 g. Insulin was then given, starting with 5 units twice a day and increasing to 10 units twice a day when the glycosuria disappeared. The diet was increased to 1555 calories (C. 39, P. 55, F. 131) and then again in two stages to 1960 calories (C. 57, P. 58, F. 167), and the insulin raised to 30 units a day in two doses given night and morning. The blood-sugar four and a half hours after breakfast and five hours after insulin was 0·24 per cent.—the urine being sugar-free with a trace of ketones.

The insulin was increased successively to 40, 45, 50, 55, and 60 units a day to lower this hyperglycæmia but the effect was only small, for the blood-sugar fluctuated throughout the day between 0·15 per cent. and 0·20 per cent., and the morning fasting blood-sugar was 0·22 per cent., so that an increase of 30 units of insulin had had only a small effect on the blood-sugar. After five and a half weeks' treatment his weight was 12 st. 1 lb., and his general condition was much improved when he was discharged from hospital.

Ten weeks later, Feb. 14th, 1925, he reported again. He had to reduce the insulin by 5 units in the evening because of the occurrence of symptoms of hypoglycæmia. His blood-sugar two and a half hours after breakfast and three hours after 30 units of insulin was 0·095 per cent., and two hours later 0·080 per cent. The recovery from the diabetic state continued and the patient never again had glycosuria. Two months later the insulin was reduced further to two doses of 20 units each. In November, 1925, he had an attack of "influenza" and was in bed for a week. Dyspnœa and œdema then developed, and a month later he was admitted to another hospital where he died in a week. During the last week before admission he had cut all carbohydrates out of his dietary, taken no insulin at all, and yet remained sugar-free. In hospital his urine was found to contain a trace of albumin but no blood or sugar. His systolic blood pressure was 170 mm. during an attack of dyspnœa but fell to 140 later. He was regarded as showing cardiac failure, and died in a sudden attack of dyspnœa with cyanosis. There was no bronchitis.

Post-mortem Examination.—A necropsy was not granted until 40 hours after death, and the organs were obtained by the courteous interest of Dr. Frank Deas. The pituitary was very large, but not cystic, and with no malignant extension. The lungs showed no naked-eye evidence of inflammation. The heart was hypertrophied, weighing 25½ oz. There was some atheroma of the mitral valves, and much more severe degeneration in the mesenteric vessels. The abdominal viscera did not show conspicuously the splanchnomegaly that may occur in acromegaly. The kidneys weighed 8 oz. each, and were slightly granular with small cysts, the general changes being arterio-sclerotic. The pancreas was large. Microscopically there were no serious pathological changes in either kidney or pancreas, after making allowance for post-mortem alterations. The atheroma of the intermediate or larger arteries had not led to much atrophy in the organs supplied by them.

Commentary.

The glycosuria in this patient was probably independent, for the acromegaly had been stationary for over 33 years and the glycosuria had developed only in the last three to four years. The glycosuria was identical with that of diabetes, it reacted similarly to insulin and control of the diet. It was severe, starvation for four days before the use of insulin failed to control it; and the renal threshold to glucose was higher than normal (between 0·21 and 0·25 per cent.).

But there is an undoubted relationship between renal function and pituitary secretion. It is possible, though not proven, that from an excessive pituitary secretion in acromegaly an elevation of the renal

[1] Ellis, A. W. M.: THE LANCET, 1924, i., 1200.

threshold for glucose might occur from direct action on the kidney. Moreover, it is now established that pituitary secretion and insulin are antagonistic, so that from an excessive pituitary secretion neutralising insulin a condition of hyperglycæmia might arise and because of the elevation of the renal threshold the hyperglycæmia would not produce glycosuria. Thus a condition of persistent hyperglycæmia would occur and the long-continued strain on the islets of Langerhans due to the stimulus of excessive sugar in the blood would result in damage to them and failure in production of insulin with consequent glycosuria and diabetes mellitus. In this way the above case could be brought into line with a pituitary origin for the glycosuria, the ultimate failure of the islets not having occurred until 30 or more years after the onset of hyperpituitarism. It is noteworthy that the diabetic tendency lessened as the result of treatment with insulin and strict control of the diet, and that the necropsy did not reveal positive evidence of such disease in the pancreas as would have made it certain that the diabetes was of pancreatic origin.

Medical Societies.

MEDICAL SOCIETY OF LONDON.

AT a meeting of this Society held on Feb. 22nd, with Sir HOLBURT WARING, the President, in the chair, Sir HUMPHRY ROLLESTON introduced a discussion on the

ÆTIOLOGY AND DIAGNOSIS OF GALL-STONES.

It was difficult, he said, to separate the closely allied subjects of gall-stones and inflammation of the gall-bladder, especially in the matter of diagnosis. Cholelithiasis occurred most frequently in "fat, flatulent, fertile females over 40," among the reasons for this being pregnancy, disordered metabolism leading to increased cholesterol content, the risk of puerperal infection, and sedentary habits. The two immediate causes of gall-stone formation were infection of the biliary passages and that disorder of the metabolism of fats which brought about an excess of cholesterol in the blood, and therefore in the bile. Sir Humphry Rolleston discussed the probable mechanism of these. A non-hæmolytic streptococcus was believed by some to be a more important cause of cholecystitis than *B. coli*; but numerous others gave the latter a prime place. It might be a sequel of typhoid fever, even many years after the fever. The view that appendicitis might be secondary to cholecystitis had received but little support. Of 411 cases of gall-stones, Soper ascribed 106 to diseases of the colon. Excess of cholesterol in the blood (the normal being 0·16 per cent.) McNee showed was accompanied by increase in the bile. The metabolic and infective factors in the production of cholecystitis were often combined. There were many cases of very chronic cholecystitis without cholelithiasis, and these would probably so greatly benefit by medical treatment that the more serious sequel would not arise.

In a summary of probable mechanisms in the formation of calculi Sir Humphry Rolleston said that pure cholesterol calculi were formed aseptically and without causal inflammation in a healthy gall-bladder, as a result of a metabolic excess of cholesterol in blood and bile. They might remain latent, or might lead to the common mixed calculi which were favoured by the excess of cholesterol in blood and bile. Small pigment calculi, formed of bilirubin and calcium carbonate, probably formed apart from infection, though were frequently determined by it.

With regard to disposing factors, pregnancy was an important one; gall-stones were ten times commoner in fertile than in sterile women. Stagnation of bile was said to favour their formation. Another factor was over-eating, probably by increasing the available cholesterol. The war privations in Russia showed in the Leningrad Hospital a drop in these diseases from 4·7 per cent. (1916) to 0·8 per cent. (1919). Heredity also played some part, in the direction of a defective metabolism. And arterio-sclerosis and chronic renal disease also increased the cholesterol content of the blood.

In the matter of diagnosis—a very large subject—he proposed only to raise a few points. Clinically, the symptoms need to be considered according to their position—i.e., whether in the gall-bladder, the cystic duct, the common bile-duct, the ampulla of Vater, or in the intestine producing obstruction there. These he considered in some detail. When a calculus emigrated out of the gall-bladder it began to cause symptoms more referable to irritation of the biliary tract. He mentioned aberrant forms and the conditions the symptoms simulated. When the calculus passed into the common or other bile-ducts jaundice occurred. Among 1000 operations on the gall-bladder and biliary tract, Truesdale found 75 cases of obstruction of the common bile-duct; and of these, 37 were due to gall-stones, 14 to acute, 16 to chronic pancreatitis. All the pancreatitic cases had gall-stones. Pancreatitis was very likely to ensue from a calculus in the ampulla of Vater.

He regarded X ray examinations in these cases as of rapidly increasing value. The direct method, which showed the stones directly on the plate in 50 per cent., was being improved by inflation of the abdominal cavity with oxygen. But the intravenous injection of tetrabromphenolphthalein was prone to give severe reactions, though tetraiodophenolphthalein was less toxic and could be given in pill form. Indirect evidence of gall-bladder disease was distortion of the pyloric region of the stomach, the duodenal cap, or the hepatic flexure of the colon by the traction of adhesions, or by pressure exerted by a large gall-bladder.

Laboratory tests were less decisive in the diagnosis of gall-stones than in that of many other conditions, and at best only provided one of several factors to be considered. Cammidge's tests of urine and fæces had now fallen out of favour, but the speaker said that he had for years experienced much help from Cammidge's reports as to the diagnosis of doubtful cases of jaundice which might be due either to gall-stones, pancreatitis, or new growth.

The Surgical Aspect.

Mr. R. P. ROWLANDS presented the subject from the surgical side. He said that most reliance at present could be placed on a painstaking study of the clinical symptoms and the ordinary physical signs. Still, every source of information should be tapped and used as a help in diagnosis. Except in really urgent cases, much was to be said in favour of a careful routine examination. Gall-stones were often distinguishable from other conditions by the long duration and the recurrent character of the symptoms which might follow pregnancy or enteric, chiefly in fat, middle-aged women. The symptoms of gall-stones were more vague and capricious than those of duodenal ulcer, and they gave a tenderness on deep percussion higher up and further out. Hyperchlorhydria was only occasionally associated with gall-stones, but was almost constant in duodenal ulcer. X ray examination was important in excluding such diseases as duodenal ulcer and cancer of the stomach, but he did not regard it as so important as Sir Humphry Rolleston suggested. Examination of the duodenal bile was a very valuable method, as it often showed pus, or crystals, or an excess of mucus. Cancer of the stomach sometimes presented considerable difficulties, especially when achlorhydria was discovered. But its deficiency might be accidental and have no relation to cancer. The fever of cholangitis had been mistaken for malaria, but should not have been if a blood examination had been made. He had known a blood-clot cause severe colic by blocking the common bile-duct; the lady died from hæmorrhage which had originated in an ulcer

in the neck of the gall-bladder due to a stone having become impacted there. In half the cases of hæmolytic jaundice gall-stones were present, and in many the gall-stones were removed, but the jaundice was not cured until splenectomy had been done. He considered that intestinal obstruction was nearly always overlooked until it was too late. In cases of obscurity it was often wisest to open up and conduct an exploration. In ten gall-bladders which he had removed there was already carcinoma, and not one of the patients had yet had a recurrence, though one was removed 15 years ago.

The Radiological Aspect.

Dr. ROBERT KNOX presented the radiological aspect of the subject, his contribution consisting chiefly of the epidiascopic demonstration of a remarkably instructive series of skiagrams of his own and Dr. Stewart's, of New York. He said the greatest advance in the delineation of the shadows in the deep regions under discussion followed the use of tetraiodophenolphthalein, and the oral administration of this he regarded as safe.

Discussion.

Mr. PATERSON ROSS spoke favourably of the cholecystography method, and pointed out that the serious reactions following the oral method occurred in the early cases. The solution certainly became more toxic with keeping, even in ampoules, therefore it should be used very fresh.

Sir CRISP ENGLISH agreed with Sir Humphry Rolleston's disposing conditions tending to the production of gall-stones, and insisted that gall-stones were a very common condition. In 4300 post-mortem examinations he found 242 cases of gall-stones, or 5·7 per cent. A conclusion therefore was that they often occurred without causing symptoms. He agreed with Mr. Rowlands that the diagnosis of gall-stones was mainly a matter of hard clinical work; often careful watching would result in a correct diagnosis in a difficult case. He spoke highly of Dr. Knox's demonstration.

Dr. RALPH KNOTT said that after doing a series of 200 examinations of duodenal contents for diagnostic purposes in connexion with gall-bladder disease, the question arose whether it was worth while. If positive results were obtained they were useful, as the surgical findings accorded with them, but a negative report was of much less value. These tests, he thought, should be used when other evidence was either doubtful or conflicting.

Dr. PARKES WEBER discussed the question of hepatic efficiency in diagnosing cirrhosis of the liver differentially from cholelithiasis. In some cases a surgeon had operated when subacute hepatic atrophy was present, with the result that the anæsthetic caused a fatality. Hepatic efficiency tests should, he thought, be used by surgeons before operating.

Dr. LENNOX WAINWRIGHT pointed out that the injection salts for promoting clarity of radiographic pictures suffered from exposure to light, and would probably alter in character.

Sir WILLIAM WILLCOX uttered a note of warning concerning the intravenous injection of tetraiodophenolphthalein. He said the extra clearness of radiographic shadows of gall-stones was often due to the presence of traces of copper in them. He had also found minute traces of the same metal in fæces which he had examined. He agreed with Mr. Rowlands as to the great value of the clinical evidence of gall-stones. Also a four-hourly temperature observation was of use, as gall-stones usually produced a rise to 100° F., whereas renal conditions did not.

Dr. KNYVETT GORDON said he considered a careful histological examination of the blood was of some value in the diagnosis of gall-stones; there was nearly always an associated polymorphonuclear leucocytosis. The *B. coli* had much to do with these conditions, but not the ordinary strain, and he advocated the application of laboratory tests to the *B. coli* found in the stools. The diastatic content of the urine was also important in the diagnosis of malignant growth at the head of the pancreas; it was not increased in gall-stones or cholecystitis, but was in pancreatic disease.

The PRESIDENT spoke of the kind of case, of which he had seen several, where operation did not reveal gall-stones, but a very long gall-bladder hung down from the liver by a small attachment, and when it got twisted it caused attacks of pain closely resembling those of gall-stones. In some of these he had deliberately removed the gall-bladder and the patient had remained free from pain though the operation was done years ago. On more than one occasion, when patients had come under observation because of what was thought to be gall-stones, the urine had been found to have a considerable increase of diastase due to recurrent pancreatitis, and by treating the latter the trouble had been got over. Removal of carcinoma of the gall-bladder gave much better results in regard to freedom from recurrence than did operation on carcinoma elsewhere.

LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY.

AT a meeting of this Society held on Feb. 5th Mr. A. L. WHITEHEAD, the President, occupied the chair, and a paper by Prof. J. W. MCLEOD and Dr. BERTHA WHEATLEY was read, entitled

The Importance of Bacterial Hæmolysins in Pernicious Anæmia.

The emphasis recently laid on the importance of achlorhydria in pernicious anæmia had awakened, they said, fresh interest in the bacterial hæmolysins as possible factors in the development of this disease; for an increased bacterial content of the upper bowel in achlorhydria had been accepted by all investigators. Their own observations had been made with the help of Dr. W. MacAdam in obtaining duodenal fluids by means of the Einhorn tube. Twelve cases of pernicious anæmia and several patients with normal or hyperchlorhydric gastric juice, as well as one or two achlorhydrias without anæmia, had been investigated. The general impression obtained by examining both fresh and heated blood-agar plates inoculated from these fluids was that in all achlorhydrias the duodenum contained large numbers of bacteria amongst which the pharyngeal and bowel types were fairly evenly represented.

It was noteworthy that no actively hæmolytic streptococcus had been isolated, although the common types of mouth streptococcus, which gave slight haloes of clearing on blood-agar plates, were usually present. The two hæmolytic bacteria found were the hæmolytic hæmoglobinphilic bacterium of Pritchett and Stillman and *B. welchii*. The first had been found more often, but *B. welchii* produced a more powerful hæmolysin. Prof. Adrian Stokes in this country, and Moench, Kahn and Torrey [1] in America had recently drawn attention to the markedly increased content of *B. welchii* in the fæces in pernicious anæmia. Unless a specific parasite responsible both for the achlorhydria and the anæmia existed, it seemed likely that *B. welchii* played the chief rôle in producing anæmia when once the bowel and throat bacteria had invaded the jejunum and duodenum. Difficulties, however, existed in regard to the rôle of *B. welchii*, since it had been found, by Kahn and Torrey and by Cornell, that injections of Welch toxin induced an increase in the polymorphonuclear leucocytes, and also, after a short time, immunity.

Dr. J. GORDON read a paper on the

Influence of Amino-Acids on Bacterial Growth.

Fourteen different amino-acids, he said, had been investigated separately with reference to their effect on the growth of bacteria in concentrations from 0·1 per cent. to 1·0 per cent. in 1·0 per cent. peptone broth. No marked effect had been observed on the growth of bacteria, such as *B. coli* and staphylococcus,

[1] Journal of Infectious Diseases, 1925, xxxvii., 162.

which constantly grew freely in peptone broth. Such of the more delicately-growing bacteria as were tested had been distinctly influenced by some amino-acids, and by this criterion the amino-acids might be divided into three groups: (*a*) *Indifferent:* arginine, glutamic acid, histidine, leucine, lysine, tyrosine, and valine; (*b*) *favouring:* taurine, aspartic acid, and alanine; and (*c*) *inhibitory:* cystine, glycine, phenylalanine, and tryptophane. In the absence of serum or blood, media with a basis of tryptic digest were inferior to peptone broth for growing delicate bacteria; such media could be improved if a considerable part of the amino-acid was removed by butyl alcohol extraction.

Demonstration of Specimens.

DR. H. H. MOLL (Leeds), in association with Dr. C. W. VINING, showed an example of a Meckel's diverticulum 2 ft. 9½ in. long. The diverticulum had become dislocated from its normal anatomical relationship to the small intestine and ran parallel to it for the whole of its course, and was also firmly and physiologically adherent to it. The whole specimen had the appearance of several feet of double intestine. Dr. Moll had been unable to find a similar case in the literature. He showed a diagram indicating the way in which, in his opinion, the diverticulum had been dislocated from the antimesenteric border of the small intestine.

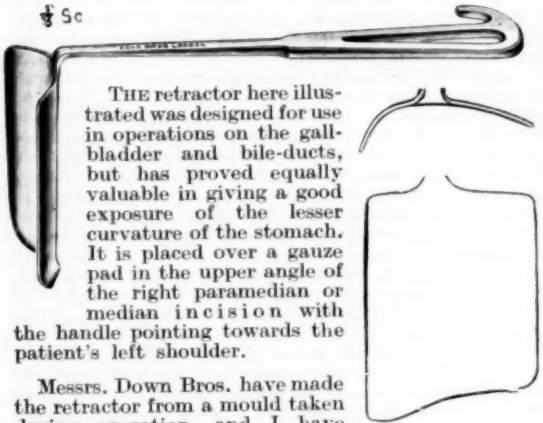
MR. CARLTON OLDFIELD described a case of ovarian pregnancy and demonstrated the specimen. He reviewed the whole subject of extra-uterine gestation and gave an historical account of its place in obstetrics since the time of Lawson Tait.

DR. MAXWELL TELLING, Mr. J. A. COUPLAND, and Dr. E. O. CROFT also contributed to the discussion.

Other specimens were shown by Dr. T. H. L. BEDFORD, Dr. A. L. TAYLOR, Mr. A. RICHARDSON, Mr. G. SYMONS, and Dr. VINING; and Dr. F. S. FOWWEATHER made Some Remarks on Osteomalacia with special reference to a recent case.

New Inventions.

AN IMPROVED RETRACTOR.



THE retractor here illustrated was designed for use in operations on the gall-bladder and bile-ducts, but has proved equally valuable in giving a good exposure of the lesser curvature of the stomach. It is placed over a gauze pad in the upper angle of the right paramedian or median incision with the handle pointing towards the patient's left shoulder.

Messrs. Down Bros. have made the retractor from a mould taken during operation, and I have found it fulfils its purpose admirably.

HAROLD UPCOTT, F.R.C.S. Eng.

KINGSTON-UPON-THAMES POOR-LAW HOSPITAL.—The Kingston Guardians have decided by a large majority to proceed with their scheme for the enlargement of their hospital and the erection of a nurses' home at an estimated cost of £100,000. The opposition was based upon the possibility of boards of guardians shortly being abolished.

Reviews and Notices of Books.

THE THERAPY OF PUERPERAL FEVER.

By Privatdozent Dr. ROBERT KOEHLER, formerly Assistant of the Gynæcological Department of the Krankenhaus Wieden, Vienna. English edition prepared by HUGO EHRENFEST, M.D., F.A.C.S., Associate in Obstetrics, Washington University School of Medicine. London: Henry Kimpton. 1926. With 27 illustrations. Pp. 276. 18*s*.

IN the preface to the American edition of this monograph Dr. Ehrenfest states that to his knowledge no work dealing specifically with the problem of puerperal infection has been presented to English-speaking physicians within the last 15 years. It was for this reason that he decided to translate Dr. Koehler's book. The translation appears at an opportune moment, when the inefficacy of many of the therapeutic measures formerly advocated has been only too well demonstrated. Quite recently newer methods, such as chemotherapy and non-specific protein therapy, have figured largely in the treatment of puerperal infections and the author here attempts to assess their true value. At the clinic of Prof. Josef Halban in Vienna, Dr. Koehler has had abundant material and ample means of testing these and other remedies. This investigation he has fully recorded, giving the results of his own experience with each and illustrating important facts by quoting the clinical histories of typical cases. Post-mortem examinations were made on the majority of fatal cases. Animal experiments were not carried out, as the author was convinced that the exact mode of infection that in a woman leads to puerperal fever could not be produced in the lower species; therefore, therapeutic success in the laboratory with any given remedy left the clinician unconvinced.

The book is divided into two parts. Part 1 deals briefly with the prophylactic measures taken to prevent infection, amongst which the method of rectal examination is considered important. The routine use of preliminary lactic acid douches and prophylactic immunisation with vaccines and sera are not favoured. Part 2 deals with therapy, and concludes with an extensive bibliography of 26 pages. Innumerable curative measures are here discussed. A few of the more important ones may be referred to. The author repudiates the doctrine of the activists and deals conservatively with the post-partum uterus. On principle he refrains from instrumentation in the presence of puerperal infection, breaking this routine only in cases where an excessive hæmorrhage caused by placental rests could not be controlled by tight packing of the uterus. He wholly condemns the operation for ligation of veins, and bases his opinion not only on a careful study of necropsy findings but also on the difficulty of diagnosing the extent of the thrombosis and the existence of a concomitant lymphangitis. In his hands curative methods based on the introduction of antiseptics, foreign proteins, or sera into the blood have so far proved inefficient. Actual cure by milk injections was not observed in a single case and this form of treatment was discontinued some years ago. The results of treatment with vaccines, and especially with heterovaccines, compare well with any method of treatment so far suggested, but Dr. Koehler is of the opinion that a rational therapy of puerperal fever is still to seek.

The book is a scientific and masterly treatise.

MALIGNANCY AND EVOLUTION.

By MORLEY ROBERTS. London: Eveleigh Nash and Grayson. 1925. Pp. 319. 18*s*.

As far as can be discerned among the mass—or perhaps rather volume—of words with which it is overlaid, the author's thesis seems to be that cancer is a "hostile symbiosis" of the same nature as organs

show in individual development and in evolution. A tumour may in this way be a tentative organ which has somehow been able to evade the normal coöperative control of the body; it may succeed in the individual and kill him, or it may succeed phylogenetically and make a new gland. In one point this view has much to commend it, for it regards tumour formation as an almost normal process and therefore in posing the question of the cause of cancer it asks: Why does not everybody have cancer? instead of the customary, Why do some people have cancer? It gives, that is, particular attention to the mechanism which prevents all epithelia from growing cancers. How far the author succeeds in establishing his hypotheses must be left to those who have the leisure to read his book. His whole idea of the relationships of the different parts of the body being one of hostility rather than of coöperation is probably wrong, and his analogy between the organism and a human society mistaken. But hardened professionals will needs be interested to see how some of their facts strike an astute and studious layman and what he adds them up to. Mr. Roberts, for instance, appreciates that splenomegalic polycythæmia is a tumour; he puts a juster value on the work of Gye and Barnard than some people have done; and he sums up the ways of science and the probable value of outside interference very well when he says: "It is hard to persuade the zealous and brilliant experimentalist that a week of reading and contemplation of other work may give greater results than a month or even a year in a laboratory, while those who might utilise the labour of others too frequently lack the scientific armament which would enable them to undertake such a task." And those who have patience will find many such spots on which Mr. Roberts has put an interesting finger.

A TEXT-BOOK OF MEDICAL DIAGNOSIS.

Third edition. By JAMES M. ANDERS, M.D., Ph.D., Professor of Medicine, Medico-Chirurgical College Graduate School of Medicine, University of Pennsylvania; and L. NAPOLEON BOSTON, A.M., M.D., Associate Professor of Medicine, Graduate School of Medicine, University of Pennsylvania. London and Philadelphia: W. B. Saunders Company. Pp. 1422. 55*s*.

THE authors have attempted to produce in one volume a reliable aid to the diagnosis of medical diseases for the general practitioner and student. Diagnostic aspects of each complaint are discussed more exhaustively than is possible in text-books of medicine. The general plan of the second edition has been retained and recent advances have been added.

As a book of reference it is well arranged. The index is good and the subheadings make for rapid work. The pathological definitions of each disease give a clear conception based on its morbid anatomy. The value of this method of approach is emphasised by the authors; its advantage is seen specially in the description of syphilis of the central nervous system and disseminated sclerosis, conditions in which the great variety of symptoms and signs at onset depend on the part of the nervous system first attacked. The separate headings at the end of each section for laboratory diagnosis and summary of diagnosis are valuable and the tables of differential diagnosis, of which there are many, are a useful addition. Clinical methods of investigation are explained fully at the beginning of each system. These are illustrated with diagrams of surface markings and photographs of actual methods of examination. Laboratory methods of use in diagnosis are described; X ray methods are dealt with in special sections and well illustrated. In some instances diseases attacking children as well as adults are treated separately. The space available for this purpose is necessarily limited, but a special section on the diagnosis of rheumatism in children might well have been included. The cinematograph illustrations do not give a very clear idea of the abnormalities of gait they represent and a single picture showing the characteristic posture in such cases would probably be more helpful. Apart from this the illustrations are of outstanding merit.

The value of a text-book of diagnosis depends largely on the accuracy of emphasis laid on each symptom, sign, and investigation described. Only by a true knowledge of these proportionate values can a high standard of diagnostic accuracy be maintained, and needless research, often worrying to the patient, be avoided. In this respect the authors have succeeded as far as is possible in a book containing a great amount of information.

A MANUAL OF HYGIENE AND PUBLIC HEALTH.

By JAHAR LAL DAS, D.P.H., Officiating Assistant Director of Public Health, Bihar and Orissa, Calcutta: Butterworth and Co. (India), Ltd. 1925. Pp. 634. 10*s*. 6*d*.

THE subtitle of this manual describes it as a text-book for medical and public health students, and it is obviously meant for those who intend to practise in tropical countries. It has much in common with the "Treatise on Hygiene and Public Health," in the writing of which the author collaborated with Dr. B. N. Ghosh, but important new matter has been added.

The book deals in 28 chapters with most of the subjects of importance to the sanitarian in all countries—e.g., vital statistics, climate and meteorology, ventilation, water-supplies, soil, housing, food, refuse and sewage disposal, disposal of the dead, sanitation of villages, fairs, festivals and camps, infection, insect carriers of disease, animal parasites, communicable diseases, personal and industrial hygiene, maternity and child welfare, school medical inspection, and popular education on health. Certain rules and orders in connexion with public health in force in Bihar and Orissa, or in the whole province of Bengal, are reproduced in six appendices. The effective way in which this wide range of material is brought within small compass leaves little scope for criticism. The sequence in which the subjects are taken is a little unusual. It would probably have been more in keeping with the order of ideas which a teacher of public health desires to convey to his students if each had been placed more or less in the order set out above.

Throughout the book mention is made of most of the modern work relating to hygiene, but the terminology is not always up to date. For instance, the term "ptomaine poisoning" is still used, and a bacillus causing food poisoning, presumably the *B. aertrycke*, is referred to under the older name of *B. suipestifer* and classified as one of the paratyphoid bacilli. The classification of rats, a matter of special importance in the East, is very lightly dismissed and the old family name *mus* is retained. References to the original monographs on which our knowledge of plague, epidemic goitre, the association of rickets, and the purdah system in India are founded might with advantage be added in a second edition. Moreover, Leonard Rogers's work on the treatment of leprosy, which is of preventive significance, and the forms of cancer associated with customs peculiar to the East should receive notice.

The discussion of many of the subjects touched upon is a little too elementary for the post-graduate student, and it would be unsafe to rely entirely on this book for the purpose of the diplomas of public health granted by examining bodies in this country. It is, however, well suited for the use of English-speaking Indian medical students and will be useful to young medical men in this country whose work is likely to lie in India or elsewhere in the East. The problems peculiar to these countries are constantly referred to in illustration of the principles of sanitation, and space is not wasted in any attempt to convey clinical or bacteriological knowledge which may have a bearing on hygiene but ought to be the subject of separate study.

SURGERY.

An Introduction to Surgery. Second edition. By RUTHERFORD MORISON, M.D., F.R.C.S., M.A., D.C.L., LL.D., Emeritus Professor of Surgery, Durham University; and CHARLES F. M. SAINT, C.B.E., M.D., M.S., F.R.C.S., Professor of Surgery, Cape Town University. Bristol: John Wright and Sons, Ltd. 1925. Pp. 347. 15*s.*

IT is always difficult for the student beginning clinical work to discover any order in the seeming chaos of surgical knowledge. Indeed, so little is really known of disease that it is not yet possible to generalise very much or indeed to build up any logical science, stage by stage, as is possible in the more exact realms of knowledge which the student has studied in his preliminary courses. Prof. Morison has grasped the difficulties of the student and has made the path easier by pointing out how it is often possible to argue by analogy from one surgical condition, and predict the course of events in another apparently quite unrelated. Prof. Saint has been responsible for an added section in which the principles enunciated in the first edition are amplified and illustrated. No book could be read with more profit by the student new to clinical work, and this second edition will assuredly be welcomed by him.

Surgery of the Stomach and Small Intestine. By J. SHELTON HORSELEY, M.D., Attending Surgeon, St. Elizabeth's Hospital, Richmond, Va. London and New York: D. Appleton and Co. 1926. Pp. 325. 21*s.*

THIS monograph has one highly commendable feature; there is included a section of 36 pages on the physiology of the stomach and intestines. This gives us a clue to the author's work. His outlook is always physiological and his treatment is moulded by such considerations. Ethylene is adopted as the routine anæsthetic because it seems to affect cardiac activity less than any other known anæsthetic. Yet ether must be added at times to obtain relaxation. Nitrous oxide and oxygen for long operations is condemned. The advantages of some form of local anæsthesia are conceded, but its limitations are recognised. Under the surgery of gastric ulcer considerable prominence is given to the author's method of pyloroplasty, but the place of other operations is duly acknowledged and in this respect a well-balanced judgment is given. A meagre account only of gastro-jejunal ulcer appears, and very little guidance for the treatment of this distressing complication. Where the Billroth I. operation is performed the duodenum is sutured to the lesser curve extremity of the stomach lumen, a procedure which must restrict the applicability of the method. The surgery of the small intestine is represented almost solely by obstruction. It has been given less detailed consideration than diseases of the stomach. The chapter on diagnosis of gastric disorders by a collaborator of the author is only moderately good. It would be easy to point to other defects in the book, but the good points outweigh occasional failure to reach the high standard set by the better sections.

HEALTH OF THE WORKERS.

By Sir THOMAS OLIVER. London: Faber and Gwyer, Ltd. 1925. Pp. 226. 2*s.* 6*d.*

THIS small volume is intended to meet the needs of all members of the community, not merely those of our professional colleagues. In size it is little more than a pocket-book; but the author has condensed into its ten chapters a vast amount of interesting and useful information. Throughout the modern view of industry is presente'—viz., that occupation should be health-giving, and t no man's occupation should be a menace to his h or a risk to his life. How far industry falls sho this ideal is set forth, and how the ideal may be ined is pointed out. Sir Thomas Oliver has himsel. aken no small part in ameliorating the lot of the worker and in minimising many of the risks to which in the past he was exposed, particularly in regard to miners' phthisis and lead poisoning. Short but clear accounts are given of many different occupational diseases; the facts stated may generally be accepted as accurate.

We commend this book especially to panel practitioners working in industrial districts.

THE ASSAYING OF BRABANTIUS AND OTHER VERSE.

By C. S. SHERRINGTON. London: Oxford University Press. 1925. Pp. 67. 4*s.* 6*d.*

Prof. Sherrington publishes a slender collection of verse much of which has already appeared in the *Oxford Magazine*. He uses in the small selection a good many metres with facility, showing command of vocabulary and simile; nor are the poems a direct reflection of the work of others, as must so often happen with the poet whose main work lies outside the strict business of literary construction and expression. On the contrary, in an austere and picturesque way he is quite original as well as often melodious. The little volume closes with a quintette of sonnets in which he shows himself able to write of large things within the limits so straitly laid down by the form, and one of these, entitled "Speech," is notable in this way. Prof. Sherrington takes his place rightly among a growing group of medical men who have turned to verse for the expression of their intimate thoughts.

THE MOSQUITOES OF EGYPT.

By T. W. KIRKPATRICK, B.A., F.E.S., Senior Entomologist, Ministry of Agriculture, Egypt; Anti-Malaria Commission of the Egyptian Government. Cairo: Government Press. 1925. Pp. 224. Piastres 30.

THIS imposing memoir is a much more serious contribution to medical entomology than its title would leave one to believe. In scope it reaches far beyond the confines of the country with which it deals; not only are the anatomy, morphology, and habits of the imago, larva, and pupa accurately described, but the classification and the somewhat ponderous synonymy, which have burdened this branch of entomology, are, it is hoped, finally unravelled. In fact, we know of no other publication of its size which deals with the subject so exhaustively. The clearness of the type, the exact and beautifully executed line drawings (the work of Mr. Eugène Kassessinoff), which are grouped together for the most part in 24 plates forming an appendix to the volume, are specially to be commended. The arrangement of the subject-matter is logical and there is a complete index. We congratulate the author, the Ministry of Agriculture, and the Government Press of Cairo on producing such an excellent piece of work.

MAISTRE WACE.

A Pioneer in Two Literatures. By J. H. PHILPOT, M.D. London: Methuen and Co., Ltd. 1925. Pp. 155. 7*s.* 6*d.*

Dr. Philpot, already known as a novelist under the name of Philip Lafargue, has here given us a charming little study of some of the work of a writer who is almost unknown except to specialists. Maistre Wace was an Anglo-Norman poet, born in Jersey in the first decade of the twelfth century, who wrote the Roman de Brut, a history of the British kings from the time of King Arthur, and as a continuation, the Roman de Rou—namely, the history of the Dukes of Normandy and the Norman Conquest. Wace is probably forgotten by most people as the author of the Roman de Brut, but not very long after his death the poem was expanded by Layamon into his Brut, one of the landmarks of English poetry. The Roman de Rou, however, about the time of Richard II., began to be forgotten, owing to Norman French becoming a dead language, and it was not until the seventeenth century that the antiquary Duchesne copied out the first part of the poem. It was not printed until 1827, when Mr. Pluquet issued an edition at Rouen, and 50 years ater a German scholar, Dr. Andresen, issued an

edition with a valuable introduction and notes, which edition is the one Dr. Philpot has used for the purposes of an essay which all those interested in the history of their country should read. With much of the matter of the poem many of the more senior among our readers will probably be familiar, from Miss Yonge's delightful study, the Little Duke, otherwise Richard the Fearless, son of William Longsword and grandson of Wace's "Rou," who was Rolf, Duke of Normandy. One passage of the Roman de Rou is famous as being the most complete account of mediæval nautical matters which we have, though some of the technical terms are difficult to understand. Dr. Philpot gives a translation of the passage on p. 56 et seq., though he confesses that he is not satisfied with it. Those who would like to make a further attempt will find the original in the appendix, p. 143. In view of the possible appearance of a second edition we may note that the page references in the Table of Contents do not correspond with the page numbers in the body of the book until we come to the appendix.

Dr. Philpot's essay is one which should send its readers to the original for further information.

JOURNALS.

TRANSACTIONS OF THE AMERICAN ASSOCIATION OF GENITO-URINARY SURGEONS. Vol. XVIII. (Williams and Wilkins Company, Baltimore, Maryland).—This volume contains the papers and reports of discussions at the meeting of the Association held last May. A great variety of subjects has been dealt with. Dr. C. H. Chetwood has given a very complete review of stenosis of the bladder neck, a condition to which various labels have been attached—*prostatisme sans prostate*, atrophy of the prostate, and chronic contracture of the bladder neck. In summing up our knowledge of the condition, he states that contracture of the vesical neck is a term that embraces a variety of conditions having in common one principal feature—namely, obstruction to the urinary flow of the bladder outlet. In his opinion this obstruction may be congenital or acquired, and in the acquired condition inflammation plays an important rôle.—Dr. J. R. Caulk treats the same subject and deals more particularly with the use of the cautery punch as a remedy for prostatic obstruction. Dr. Caulk has found greater and greater scope for the use of his instrument, whereas in 1920 he considered that only 14 per cent. of cases of prostatic obstruction were amenable to treatment by the punch; during the last year he has employed this method of treatment in 63 per cent. of his patients.—Dr. H. G. Bugbee considers that in many cases that can be treated by means of a punch operation suprapubic drainage is a useful preliminary.—Dr. H. L. Kretschmer and Dr. Nathaniel B. Rathbun deal with strictures of the ureter, and Dr. J. L. Grenshaw and Dr. D. W. Mackenzie with bladder growths.—A full account of the treatment of urological infections by means of intravenous injections of mercurochrome and other urinary antiseptics is given by Dr. H. H. Young and Dr. J. A. Colston. They consider that, although none of these drugs act as a specific, valuable results have been obtained, especially with mercurochrome. Even although unexpected failures have occurred they consider that the sum total of results obtained are brilliant, and that a urological therapy of great importance has been opened up by the use of intravenous injections of urinary antiseptics.—Dr. W. F. Braasch and Dr. H. C. Bumpus, while less enthusiastic in their statements, endorse the value of intravenous chemotherapy in the treatment of urinary infections. But Dr. A. C. St. George, in describing the post-mortem examination of five cases of sepsis treated with mercurochrome, utters a note of warning. Whatever its value as an antiseptic, he points out it must be remembered that mercurochrome is a toxic drug and that the margin of safety between a therapeutic and a toxic dose is variable and small.—Other articles of interest are furnished by Dr. H. Cabot and Dr. F. S. Patch on the operative treatment of malignant kidneys and typhoid infection of the kidneys respectively.

Reports and Analytical Records.

(1) DIAL, LIQUID AND AMPOULES; (2) CIBALBUMIN; (3) DIOCAINE.

(CLAYTON ANILINE CO., LTD., PHARMACEUTICAL DEPARTMENT, LONDON, E.C. 4.)

(1) *Dial, Liquid and Ampoules.*—We have on previous occasions pointed out the hypnotic-sedative properties of Dial (diallylbarbituric acid) and its derivatives, and the properties of these drugs are so well known to the medical profession that it is unnecessary to go over the old ground. Up to now Dial has been available in tablet form only, but Dial liquid compound, each c.cm. containing 1½ gr. of Dial, for oral use, and ampoules, each containing 3 gr. of Dial, for hypodermic use, are now available. Dial has been used with special value among mental patients as a hypnotic, restoring the sleep habit effectively while the dose can be gradually reduced.

(2) *Cibalbumin* represents an aqueous and limpid solution of egg albumin which is aseptic and free from ferments and undesirable salts. The hypodermic, intramuscular, or intravenous injections of even large therapeutic doses have always been well tolerated, and symptoms of anaphylaxis or collapse have never been observed after the administration of doses appropriate to the case under treatment. Consequently this preparation would appear to be indicated in non-specific protein therapy. The mode of action of proteins is not clear, but their employment is receiving closer attention as the value of colloidal therapy becomes known to a wider circle of medical men. Cibalbumin has been introduced to provide a uniform permanent preparation of exact dosage with which to obtain reactions which manifest themselves only in definite proportion to the dose, and the manufacturers have obtained evidence that the resulting excitation is not excessive or dangerous. The range of conditions in which it has been recommended is very large, but it is clear that protein therapy should not be employed in patients whose general condition is bad, and a note from the pharmaceutical department of the manufacturers properly suggests that in neurotic subjects or in those who have developed certain therapeutic idiosyncrasies it should not be employed.

(3) *Diocaine* (para - diallyl - oxyethyl - diphenyl - diamidine) consists of a colourless powder melting at between 152° and 153° C., and soluble in water and alcohol. It has been found useful as a local anæsthetic in ophthalmology. There is medical authority for the claim that instillations are painless and non-irritant, while the anæsthesia produced sets in rapidly and is lasting. Diocaine substance is available in vials containing 0·5 g.

ANGIOLYMPHE.

(CHARLES ZIMMERMANN AND CO. (CHEMICALS), LTD., 9 & 10, ST. MARY-AT-HILL, LONDON, E.C. 3.)

This preparation is stated to constitute a new treatment for tuberculosis "essentially different in its origin and effect to tuberculin or gland therapy." It is a vegetable remedy and the results of clinical trials must be awaited before any expression can be made on its merits, but a report has appeared in the *British Journal of Tuberculosis* from Dr. Jane Walker giving the results following over 1000 injections administered to 20 patients. The value of persistence is considered an essential point in the treatment irrespective of whether the patient appears to improve at first or not, considerable stress being thus put both upon the attention of the practitioner and the patience of the subject. The preparation has been employed in the treatment of lupus both in Paris and Charlottenburg. There appears to be nothing dangerous in the administration of the drug, but it need hardly be said that it should only be used under the strictest medical supervision.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 27, 1926.

DR. AXHAM'S APPEAL.

IT is hardly surprising that the Executive Committee of the General Medical Council, when it met last Monday, should have decided not to call a special meeting of the Council for the purpose of considering the restoration of Dr. AXHAM'S name to the professional roll, inasmuch as no such special meeting has been held since 1903, when an important discussion on medical education was adjourned from May until July in order to ensure opportunity of full and frank consideration. The Executive Committee of the Council is a body of 12, without counting the President of the Council, who acts as Chairman. It consists at this moment, in addition to the President, of the representatives of the Royal Colleges of Physicians of London and Ireland, and of the Royal Colleges of Surgeons of England, Edinburgh, and Ireland, the representative of the University of Birmingham, a Privy Council representative from respectively England, Scotland, and Ireland, two of the English and the Scottish direct representatives. Such a body —*and every member attended the meeting*—cannot fail to have seen all the professional aspects of the case, while they are aware, far more fully than are the newspapers commenting upon their decision, of all the circumstances of the case, both precedent and immediate. They have been able to appreciate exactly how far the interests of Dr. AXHAM have been advanced to further those of others, while they are bound to look at his case strictly in connexion with the duties of the Council as a whole in respect of the Medical Acts, remembering that appeals for restitution to the Register are likely to come before the Council at every session and that special sittings would break alike the financial resources of the Council and the available leisure of its members. It may be argued that Dr. AXHAM'S is an exceptional case, but the fact that he waited 15 years before making his appeal for restitution surely relieves the Council from the responsibility of taking immediate and unusual action.

PRIVATE PRACTICE AND PREVENTIVE MEDICINE.

THE Annual Oration of the Hunterian Society was delivered on Monday last by Sir GEORGE NEWMAN, who took for his subject the part played in the development of preventive medicine by the private practitioner, and was able to show that, for over 200 years, what may be called hygienic prophylaxis has largely depended for its progress upon the wisdom and enterprise of individual doctors, drawing for their justification of procedures upon personal experience of disease and therapy. From this point of view the dates in the lives of the two HUNTERS, and notably n the case of JOHN, will be seen to coincide in a striking manner with medical developments taking place at far off centres and resulting from widely different schools and schemes of work. This was well illustrated by Sir GEORGE NEWMAN in a list of collateral medical events, from which we note that JOHN HUNTER was born just as ISAAC NEWTON died, and was a link with the wonderful scientific developments of 1685; that WILLIAM HUNTER came to London in the year of the highest mortality of the eighteenth century, when the public and the doctors were alike shaken in their optimism; that JOHN HUNTER followed him just as HALLER'S "Physiology" was published, blending the scattered and often pedantic teachings of the past with the broad and living views of to-day; and that JOHN HUNTER was elected to the Royal Society in the same year that Sir GEORGE BAKER identified lead in the cider presses as the cause of "the endemical colic of Devonshire," and laid down the pattern upon which inquiries into food contamination are still conducted. JOHN HUNTER, again, was in the full course of his lectures on surgery in the very period that the discoveries of oxygen and nitrogen made the problems of respiration comprehensible; he died just before the publication of JENNER'S work on vaccination. Other interesting coincidences could be drawn from the parallel lists of dated events with which Sir GEORGE NEWMAN supplied his audience, all going to show that the feature of medical practice in the eighteenth century was the range of widely separated work that was being brought together for collation and sifting—verily the exact hour for the arrival of JOHN HUNTER.

Upon scientific discoveries emanating from such widely different sources the practitioners of the eighteenth century laid the foundations which their successors have used in the development of the accepted routine and teaching of medicine generally; but the Hunterian Orator was able to show that, while doing so, they were in a special sense the pioneers of preventive medicine. The appalling mortality among certain classes of the population urged them to explore the circumstances of epidemic disease with the result that much of the influence of external environment in its causation became clear to them as well as the value of notification and the necessity of attacking systematically the problems of infantile mortality. The drunkenness of the second half of the eighteenth century is notorious; artists like HOGARTH, authors like SMOLLETT, a doctor, and many great divines drew attention to the shameful profligacy and degradation resulting from excessive drinking; and the doctors reacted to the message and insisted, for their patients, upon a restriction of spirit-drinking, advocating at the same time improved dietaries and a wider use of vegetables, fruit, tea, and coffee. Foul domestic conditions became recognised in particular association with disease, because the doctors of the eighteenth century pointed them out, and they were the first to think of the wage-earner in connexion with industrial welfare schemes. It was the individual knowledge of these men in regard to the way that many of their patients had to live that led the public to realise the necessity for the establishment of hospitals and dispensaries, alike to provide institutional care and protection for the sick and to be centres of medical education. We can well echo Sir GEORGE NEWMAN'S summary of these and other achievements of the eighteenth century doctors: "Epoch-making as that period was in anatomy, physiology, and the new principles of surgery as expounded and interpreted by the scientific giants of the century . . . it was still more far-reaching in the sphere of preventive medicine, which not only extended the frontiers of

life for many persons then alive but laid the foundations of the public health system of the succeeding century." These things were brought about by private practitioners, the general conception of prevention arising out of a massing together of the clinical study, experience, and wisdom of individuals.

Sir GEORGE NEWMAN closed his address by pointing out, appositely all will allow, that the creation of special medical services, in the realm of preventive medicine and elsewhere, while it has produced a new general order of things, leaves the individual practitioner still serving in the first line of defence against disease, and therefore as a pioneer in preventive medicine. The allegation that the public medical services are designed to exclude the private practitioner is no longer made by thinking people: but it is well that we should be reminded that the Poor-law Medical Service has 4000 medical officers for outdoor medical relief, nearly all of whom are private practitioners; that the Post Office has a list of 3500 private practitioners on its staff; that a large proportion of medical officers of health and medical men engaged by local education authorities are still private practitioners, and only 350 are whole-time officers; and that the same is the case with all the certifying factory surgeons. The working of the National Insurance service, therefore, forms only a portion of the official duties of private practitioners; but it is here Sir GEORGE NEWMAN thinks that the practitioners of the twentieth century may use the legacies of the past to the greatest advantage, with their wider opportunity for the observance of early disease, and, accordingly, their increasing chances of ascertaining causes and of planning the appropriate methods of prevention.

MORPHINE AND HEROIN ADDICTION.

WE print elsewhere a section from the report of the Departmental Committee on Morphine and Heroin Addiction dealing with precautions to be observed by practitioners in administering those drugs. Hardly less important are the Committee's conclusions in respect of various proposals made by the Home Office for the tightening up of legislative restrictions. The existing Dangerous Drugs legislation (more particularly Article 11 of the Regulations made under Section 7 of the 1920 Act) declares that the duly qualified medical practitioner is authorised to possess or supply the drugs only "so far as is necessary for the practice of his profession." The registered dentist, registered veterinary surgeon, or research worker is subject to a like limitation. In each of these cases the Home Secretary can revoke the authorisation if the person so authorised is convicted of an offence against the Act. The Committee deprecates this insistence upon a prior conviction in the police-court. It proposes an alternative likely to be more acceptable both to the medical profession and to the Home Office. The proposal is that the law should be altered and that a suitably constituted medical tribunal should advise the Home Secretary as to withdrawal of authorisation. It is suggested that there should be one tribunal for England and Wales and another for Scotland. Each should consist of a medical member appointed by the General Medical Council, another appointed by the British Medical Association, and a third appointed in England by the Royal College of Physicians of London, and in Scotland by the similar body of Edinburgh. The present legal assessor to the General Medical Council might be appointed assessor to the proposed tribunals. The issues in these cases are essentially medical—i.e., whether there was or was not justification for administering a particular drug. It would clearly be helpful to have a uniform standard of decisions rather than that the standard should vary with every bench of magistrates up and down the country. Undoubtedly, too, the tribunals would collect valuable information. The cases which would call for decision would be those of a doctor administering or supplying drugs to other persons or to himself. In the latter class of case the tribunal would be all the more preferable to the police-court. Elsewhere in the report it appears that the Home Office asked the Committee to say whether the law should require the names of doctor addicts to be supplied to wholesale chemists so that the latter might inform the Home Office of purchases made by such doctors. This rather far-reaching proposal was wisely negatived.

On the question of improper prescribing there has always been a doubt of the Home Secretary's power of control. The Committee proposes that, to remove the doubt, it be definitely enacted that dangerous drugs shall not be prescribed except bona fide for medical purposes, and that cases of improper prescribing by doctors be referred to the medical tribunals in the same manner as those of improper possession and supply. Another suggestion was that medical practitioners administering heroin or morphine should be obliged to notify the central authority. The obligation would assist the Home Office to detect instances in which a patient obtains the drug from two or more doctors concurrently; it would also indirectly diminish supply in doubtful cases, would strengthen the doctor's control over his patient, and would relieve the profession from irksome inquiries which at present are unavoidable. But compulsory notification is open to the grave objection of imperilling the confidential relations of doctor and patient. The Committee is content to advise that, instead of compulsion, a doctor should, in his own as well as his patient's interests, inquire from the patient as to the sources of supply of the drug and as to the names and addresses of any other practitioners consulted. Yet another proposal was that in certain circumstances a second medical opinion should be compulsory. Here again the Committee prefers the voluntary principle. It considers that the profession might voluntarily adopt the rule that it is highly advisable to have a second opinion in serious drug cases just as at present in certain operations (for example, the emptying of the pregnant uterus) a rule has in effect been established. If a patient cannot afford a second opinion the Ministry of Health would be prepared to lend the services of its regional medical officers. In considering possible changes of the law, the position of the non-dispensing doctor was not overlooked. Doctors who dispense have to keep a record not only of dangerous drugs purchased, but also of those supplied otherwise than by personal administration. The non-dispensing doctor has hitherto escaped, but the Committee thinks he might reasonably be asked to keep some simple record of his purchases, if only by pasting his invoices into a book. From time to time coroners and others have recommended enlarging the scope of the Dangerous Drugs Acts. The Committee does not think there is much danger of addiction arising from any preparation at present outside the Acts except, perhaps, chlorodyne. Some witnesses favoured the compulsory establishment of a definite standard of morphine content in the case of chlorodyne and advocated such a standard as would automatically bring the preparation within the Acts. The Committee came to the conclusion that there might be some advantage in securing that no preparation should be

sold as chlorodyne which contained more than 0·1 per cent. of morphine. It found no evidence of any need to bring all morphine preparations within the Dangerous Drugs Acts or to lower the standard of strength at present fixed. It will be remembered that, a year ago, the Geneva Conference had something to say as to the scope of legislation, and that last August the Dangerous Drugs Act of 1925 gave effect in Great Britain to the international agreement to abolish the former limit of one-tenth per cent. in respect of heroin, which had previously been embodied in Section 8 (1) of the Act of 1920. All preparations of heroin are therefore now within the Acts without distinction of percentage.

On other and more general questions the Committee's report is reassuring. The Dangerous Drugs Acts and Regulations are having a restrictive effect of demonstrable significance. Addiction to morphine or heroin is reported to be rare in England and to be growing rarer. Addiction, it seems, is more readily produced by the use of heroin than by that of morphine, and heroin addiction is the harder to cure. The most important predisposing cause of addiction is inherent mental or nervous instability. Other predisposing causes are chronic pain or distress, insomnia, overwork, and anxiety. Often, it appears, addiction has resulted from previous use of the drug in medical treatment; special care is needed in the case of young patients. One witness of wide experience told the Committee that some practitioners were too cautious and administered the drug too late, with the result that, when at last it was given, the patient was so worn out and the relief so intense that the danger of addiction was all the greater. In so far as addiction is due to self-treatment to relieve pain or to the influence and example of other addicts or to indulgence out of curiosity or bravado, it is likely to diminish in the future under the restriction of modern legislation. The Committee examined evidence of the relative values of different methods of treatment, the abrupt withdrawal method, the rapid withdrawal, and the gradual withdrawal. The last of these was considered more generally suitable and more free from risk, entailing less strain upon the patient, and unattended by collapse. Clearly, however, there is no room for excessive optimism. With two exceptions the most sanguine witnesses did not claim a higher proportion of lasting cures than from 15 to 20 per cent. Permanent cure is the exception, relapse is the rule. More successful results could be obtained if this country possessed more institutions where special treatment was available, and if addicts could be compelled by law to undergo such treatment.

AMONG the 15 candidates recommended by the President and Council for election to the Fellowship of the Royal Society are several workers in medical or allied science. The recent work of Dr. J. A. Arkwright at the Lister Institute of Preventive Medicine on the filterable virus of foot-and-mouth disease was the subject of a leading article in THE LANCET of Feb. 6th. Dr. E. J. Butler has been director of the Imperial Bureau of Mycology at Kew since 1920. Lieut.-Colonel S. R. Christophers, of the Central Research Institute at Kasauli, India, has made valuable practical investigations into the scourge of malaria. Dr. H. Hartridge is a lecturer in the special senses and senior demonstrator in physiology in the University of Cambridge. University College, Reading, is honoured in the person of Dr. F. J. Cole, professor of zoology; and Liverpool will rejoice at the distinction to be conferred on Prof. W. C. M. Lewis for his researches in physical chemistry.

Annotations.

"Ne quid nimis."

SHORT WEIGHT AND MEASURE.

SOME years ago the Board of Trade directed the adoption of the thermal unit for the supply of gas for domestic purposes, and since that time no consumer has paid unwittingly for nitrogen or other inert matter which may be contained in the gas supplied to him by the approved company. Thermic value is not the only property of the domestic gas supply which matters to the consumer, though it is the most obvious: in regard to the important matter of food supply caloric value is the most prominent factor, and in the new dietary which has recently been worked out by the Army Medical Department for the British soldier the caloric values of protein, fat, and carbohydrate have been carefully regulated and the total number of calories brought up to an agreed figure. The Food Council, which has just presented its report to the President of the Board of Trade,[1] does not go so far as this, but it does propose that certain specified foodstuffs, including a large proportion of the staple foods, should in future be retailed exclusively by net weight. As the law stands at present it is quite legal, except in the case of bread and tea, to sell any foodstuffs by gross weight—that is to say, that the weight of the wrapper or container is included as part of the weight of the commodity demanded. The vendor's weighing-machine is already inspected under existing legislation and its accuracy controlled, but there is a curious misapprehension current that the placing of a counter-weight in the weight pan is illegal, and the Food Council thinks it should be widely known that the practice is not only legal, but has much to recommend it. The short weight arising from this and other causes may be and probably is individually quite small, but a series of individually small deficiencies in weight or measure on the housewife's weekly budget becomes considerable, and the Food Council had instances before it in which short weight and measure resulted in the housewife paying 8½*d.* per quart for milk instead of 7*d.*, 1*s.* 11*d.* for meat instead of 1*s.* 8*d.*, and 2*s.* 9*d.* for butter instead of 2*s.* 6*d.* Apart from the Edinburgh Corporation Act, it has been found almost impossible to obtain a conviction even for the persistent giving of short weight and measure; unless the inspector actually sees the weighing or measuring operation and can prove that the fraud in the weighing or measuring was wilfully committed, conviction has not followed. The Food Council therefore now recommends that legislative effect should be given in the present session of Parliament to its recommendation that meat, butter, cheese, cereals, sugar, coffee, jam, and potatoes (to name the headings only of a long list) should be retailed exclusively by net weight unless sold in quantities less than two ounces or in single pennyworths or less. It goes further than this and recommends that most of these foodstuffs should be retailed only in quantities of two ounces, four ounces, eight ounces, one pound, or multiples of one pound. It is a sinister fact that many food products now on the market are put up in 15-oz. packets. The quantity may be plainly stamped on the package to protect the vendor, but undoubtedly people get into the habit of regarding these packets as pound packets, and in some cases the contents have actually been a pound at first and have later been reduced to 15 oz. The Council had before it much similar evidence of jam pots which could only contain 14 oz., of milk bottles, many of them something under one pint in content, and so on. Large retailers admitted that they were unable to face the wholesaler who did not give them the quantity he purported to sell. That being so, how futile, says the report, is it to expect that the housewife can

[1] Report by the Food Council on Short Weight and Measure in the Sale of Foodstuffs. Cmd. 2591. 1926. 9*d.*

defend herself against traders who give short weight and measure. The report leads up to the main recommendation, that the giving of short weight and measure should be a statutory offence applying to wholesale trade as well as to retail trade, and that the powers of administration of the new Act should be vested in local authorities at present administering the Weights and Measures Acts. There seems no reason why the recommendations should not work smoothly. The principles are the same as in the case of bread and tea where the object has been obtained without friction and without giving rise to increase in the cost of living or the production of unemployment, which have rather absurdly been claimed as likely to result from the honest proposals. The modest protection to the purchaser given by the suggested Act should become law in the present session of Parliament.

ACUTE POISONING TREATED BY LUMBAR PUNCTURE.

A CARDINAL principle in the treatment of accidental poisoning is to hasten the elimination of the poison by every available channel. In poisoning by alkaloids venesection followed by intravenous infusion of normal saline solution has often been found useful. Lumbar puncture has recently been tried with the same end in view. At a meeting of the Vienna Medical Society Dr. F. Redlich discussed the methods used in the third medical clinic for the treatment of severe poisoning, chiefly in cases of attempted suicide. Within the last two years this clinic has had over 160 cases of the kind with 21 deaths. These included 25 attempts with veronal with 11 deaths, and Dr. Redlich has treated 13 cases of poisoning due to this drug by lumbar puncture. The cases chosen were those which were severe, but not actually moribund. The quantity of poison ingested was known only in two cases, and in these at least 5 g. (i.e., some 80 gr.) of veronal had been taken. Both recovered, as also did two other patients. In 12 cases the cerebro-spinal fluid was tested for veronal, and out of nine cases reported positive seven died; out of three cases reported negative one died. Luminal, corrosive sublimate, and lysol were also detected in the cerebro-spinal fluid in various cases, so that Dr. Redlich feels justified in recommending repeated and extensive removal of cerebro-spinal fluid in poisoning. It is, he considers, a safe method of removing part of the poison from the body, and especially from that system most susceptible to its action—the central nervous system. Other treatment is not, of course, neglected, including cardiac stimulants, stomach washes, and injections of strychnine and lobeline.

A PHYSICAL STUDY OF MEDICAL PERCUSSION.

Dr. A. Gilbert, Dr. A. Tzanck, and Dr. R. A. Gutmann, writing in the *Paris Médical* of Jan. 9th, point out that the classical accounts refer to the medical percussion note as having three qualities—namely, intensity, frequency, and timbre—and they instance the diversity of opinion amongst clinicians as to the relative importance of these qualities. Their own view is that there is a fundamental difference between musical notes and noises, that there is usually complete similarity between the conditions required for producing *noise* and those obtaining in medical percussion, and that while analysis of sounds in general shows the three qualities mentioned to be intrinsic properties of musical notes, resonance (*sonorité*) may be set up in the "acoustic field" by both musical sounds and noises. Details are given of an arrangement whereby a perforated band is made to pass over the aperture of a tube through which air is blown in a steady stream. When the perforations are regularly spaced a note is produced which rises in pitch with increasing speed of the band. On the contrary, when the perforations are irregularly spaced, no alteration in pitch can be obtained, the sound produced being a pure noise. By means of another instrument, the phonoscope of Weiss, the authors obtained photographic records of different sounds. These tracings show clearly the rhythmical nature of all musical sounds whether consonant or dissonant, as opposed to the isolated nature of noise vibrations. Only in the case of a cavity freely communicating with the outside air can a percussion sound be properly considered musical, when the terms intensity, frequency, and timbre can be applied. On this view Wintrich's percussion sign is dependent on the difference between a musical note and a noise, not, as is usually taught, on alteration of the pitch of the note. Percussion reveals two things—the presence or absence of gas in the subjacent tissues and the physical relationship of gas to tissue. The presence of gas leads to resonance, its absence to dullness. In normal lung the gas must be considered as existing in small compartments not in free communication with the outside air. Evidence is put forward to prove that, when gases are thus pent up in the tissues, a state of hypertension obscures the resonance to percussion, while relaxation leads to a Skodaic note, even if the quantity of gas be small. A tabulated list of the different degrees of resonance and the clinical conditions with which they are associated concludes a paper which is a valuable addition to our knowledge of the physical basis of percussion sounds.

A PROBLEM IN STATE MEDICINE.

THOSE persons who complain about any State interference with the relationship between doctor and patient and those who favour a whole-hearted scheme of State medicine will alike find much of interest in the present situation in America as set out in a recent issue of the *Journal of the American Medical Association*. As a result of the World War Veterans' Act of 1924 any ex-Service man who served in any campaign since 1897 is entitled to treatment and care in hospital at the Government's expense, no matter what the origin of his complaint, no matter what its nature, and no matter what his capacity to pay may be. All that the applicant has to do is to prove illness or injury and then enter a Government institution for treatment by Government physicians and surgeons. The fact that the illness or injury bears no relation to any military service, being neither caused nor aggravated by this, does not enter into the matter at all. These provisions came into force in June, 1924, and in the first financial year their estimated cost works out at a sum exceeding one million pounds, With the gradual spread of knowledge among ex-Service men this demand on the American taxpayer is likely to increase in future years, while certain politicians, not content with this, are preparing Bills to extend such beneficiary treatment, under similar conditions, to Confederate veterans and to civilian workers who served overseas during the recent war. Other measures propose that not only shall hospital care be provided for any disease and disability of these members of the community, but also free medical attention and nursing for the rest of their lives. No one who admits American citizenship is likely to complain at the acceptance by his Government of responsibility for illness and disability caused or in any way aggravated by military service, even when the term "aggravated" is generously interpreted; but the treatment of disabilities not of Service origin comes into another category. It may be that in the future some Government will boldly assert that the health of the people is its prime concern and proceed to provide free medical advice and treatment for all by means of suitable taxation. Indeed, by extending the present benefits in America to cover all civilians who have worked in the Government's service at any time, to those who have helped the Government's cause by voluntary service of any approved variety, and so forth, most of the adult population would at once be covered. The immediate effect, however, of the provisions already in force is to tend to withdraw patients from the small cities and towns to the larger

cities where Government treatment is available, and the American Medical Association, recognising the dangers of the situation, adopted a strong resolution at its last meeting of delegates calling on the Government to amend its War Veterans' Act. If a frank scheme of State medicine is intended there may be much that could be said for and against it, but the present situation is regarded by the medical profession in America as thoroughly unsatisfactory.

BASE OR SALT FOR INJECTION.

THE preparation of basic bodies for subcutaneous and intravenous injection has long been a matter of debate. As a rule, alkaloids are administered in the form of soluble salts, such as hydrochlorides or sulphates, when hydrolysis occurs in the organism, with the setting free of the pharmacologically active-free base. Mr. W. H. Martindale suggests, in another column, it would be reasonable to suppose that if alkaloids could be administered in some form which yielded the free base more readily, the activity of the preparations should be enhanced. After a series of experiments with quinine, he has been led to believe that a compound of quinine and mannitol would be more efficacious than the hydrochloride. In this preparation the quinine is virtually in the form of free base, thus absolving the body from the necessity of performing hydrolysis. Although no clinical trials have yet been made, the author's enthusiastic thesis appears well grounded. Moreover, the same considerations would apply to substances other than alkaloids. For example, hydrochloride may not be the ideal form for administering insulin. Solutions of insulin hydrochloride are strongly acid, and it would be interesting to compare the activity of this salt with that of the free substance. There are, however, a number of immediate advantages in the use of the hydrochloride which can only be sacrificed on good cause shown.

RECENT ADVANCES IN OBSTETRICS.

DURING the last 20 years the maternal mortality rate in childbed has not appreciably declined. The child-bearing mother, as Sir George Newman has recently remarked,[1] is not sharing equally with the rest of the population in the improved public health. Although statistics sometimes mislead, no one will deny that the persistence of this high mortality rate reflects little credit on the science of obstetrics. Many reasons have been put forward for failure, but one outstanding fact emerges—namely, that a large number of the fatalities could have been prevented by efficient antenatal supervision. Albeit the essential value of antenatal care has been known for long enough, its adoption is by no means universal, and Mr. Comyns Berkeley was not overstating his case when he said that "the majority of pregnant women in our country have no antenatal supervision of any kind."[2] We therefore warmly welcome the excellent chapter on antenatal care in Mr. Aleck Bourne's "Recent Advances in Obstetrics and Gynæcology."[3] Antenatal care, he there states, is the most important single line of forward movement of thought in midwifery during the last ten years. From the London Report on Puerperal Sepsis it appears that labour was spontaneous and normal in 22 per cent. of the fatal cases, and it is by no means certain that a number of these deaths could not have been prevented. Of the remaining cases where some form of interference during labour took place there is little doubt that the majority could have been saved. Exact scientific proof may be lacking, but clinically autogenous infection does seem to occur. It is now accepted that the vagina of the apparently normal pregnant woman may harbour streptococci. Of these, the majority are non-hæmolytic and seemingly non-pathogenic, but we are still ignorant as to the possibility of a biological metastasis of these organisms brought about by some specific factor connected with pregnancy. Mr. Victor Bonney, in his recent address published in our columns,[4] focused attention on this autogenous type of infection, and made a strong plea for the abolition before or during pregnancy of all septic foci, whether in the teeth, tonsils, or intestinal tract, as a means of preventing puerperal infection. Despite the large number of remedies advocated for the cure of puerperal sepsis none of them so far has stood the test of time, and the rational therapy of this disease has yet to be evolved. Some of the newer methods of chemotherapy have been systematically tested at Prof. Halban's clinic in Vienna, the results—largely negative—being set out in a book reviewed on p. 443. Biochemists have invested the condition of the blood and urine in pregnancy and Mr. Bourne gives an excellent résumé of their inquiry, which has established a number of isolated chemical facts awaiting coördination for practical clinical work. The toxæmias of pregnancy rank only second to puerperal sepsis as the cause of death amongst pregnant women. Third on the list comes hæmorrhage, where in a proportion of cases early recognition and hospital treatment would save life. Antenatal care would, however, prevent the majority of cases of puerperal sepsis and toxæmia, and when it is remembered that in England and Wales alone 30,000 women lost their lives during the last decade from causes directly attributed to childbirth, there is still room for advance in obstetric practice.

[1] Ministry of Health: Report on Maternal Mortality, 1924.
[2] Brit. Med. Jour., Jan. 2nd, 1926.
[3] J. and A. Churchill. 12s. 6d.

A NEW JOURNAL OF CHILDREN'S DISEASES.

WE extend a hearty welcome to the *Archives of Disease in Childhood*, the first number of which has appeared this month. The new journal is issued by the British Medical Association,[5] who have been fortunate in obtaining the services of Dr. Hugh Thursfield and Dr. Reginald Miller as editors. The journals already dealing with pediatrics in this country, though admirable in quality, are fewer in number than in most continental countries and in America, and there is an undoubted need of an additional medium through which, as Sir Thomas Barlow indicates in his introduction to the new issue, the numerous workers in various branches of children's disease may submit their observations for criticism and verification. The February number provides good illustration of the way in which this need is being met by the new journal, and promises much for its success. The articles which it contains are for the greater part devoted to the results of clinical research undertaken in children's hospitals. A paper by Dr. F. J. Poynton and Dr. W. G. Wyllie on hepatic cirrhosis in children offers a comprehensive review of an obscure subject. Four cases treated recently at the Children's Hospital, Great Ormond-street, are described; these cases all showed unusual features, and exemplify the difficulty of correlating clinical types of cirrhosis with particular pathogenic factors. The two familial cases, for example, were both considered on the clinical evidence to be portal rather than biliary in origin. The authors divide the cirrhoses into seven types, which are discussed severally, the morbid histology of each being illustrated by excellent photographs and colour-plates. Special attention is devoted to the biliary forms of cirrhosis, which in children are more commonly met with than those of portal distribution. These are considered under the headings of (*a*) hypertrophic, (*b*) congenital, and (*c*) obstructive biliary cirrhosis. Forms (*a*) and (*c*) are rare in this country; (*a*) and (*b*) show a remarkable tendency to familial incidence. Congenital cirrhosis may occur with or without obliteration of the bile-ducts. The pathogenesis of this form has never been fully established,

[4] THE LANCET, Jan. 23rd, 1926.
[5] London: Brit. Med. Assoc. House, Tavistock-square, W.C.1. Yearly subs. (six numbers), 25s. Single number 4s. 6d.

Dr. John Thomson regarding a malformation of the ducts, and Sir H. Rolleston the hepatic cirrhosis, as the primary and essential lesion. The possibility is suggested that a mild congenital case may be the precursor of a hypertrophic cirrhosis. In another article Dr. G. A. Sutherland describes, by means of polygraph tracings taken at different stages, a case of severe heart-block treated by injections of adrenalin, and discusses the rationale of this treatment The three papers describing investigations on rickets contain numerous points of interest Taken collectively they impress on the reader the extreme difficulty of standardising the diagnosis of rickets, and consequently, the reservations which must be attached to conclusions drawn from statistics of incidence All the three authors—Dr H. Mackay, Dr. D. Paterson, and Dr. R. Darby—based their diagnoses on radiographic examination of the wrist. Dr. Mackay frankly admits that the incidence of slight rickets is much higher than the radiographic diagnosis will indicate, and looks to examination of the blood as the diagnostic method of the future. Dr. Paterson and Dr. Darby found that the rickety process in the wrist was healed in the great majority of cases. Such cases could not be diagnosed with certainty as active rickets, and appear to have been regarded as inactive, yet it may be doubted if the presence of a healed focus in bone should be taken as evidence that the activity of a disease which manifests itself in so many systems has been arrested. There are a number of other contributions which will repay the reader's attention. All interested in pediatrics may expect much from future issues of the *Archives*.

TETANUS ANATOXIN.

OUR Paris correspondent has already referred [1] to the work on active immunisation against tetanus done by Dr. Zoeller, of the Val-de-Grâce, and Dr. Ramon, of the Pasteur Institute. On Feb. 2nd they made a communication to the Académie de Médecine on their tetanus anatoxin, and a clue to its importance is to be found in the words in which Dr. Roux, the head of the Pasteur Institute, summed up his impressions. "I cannot," he said, "sufficiently congratulate the authors on their work, both from the point of view of its practical value and of its general importance to physiology." From what was said it appears that tetanus anatoxin, derived from tetanus toxin, is quite as effective an antigen as the parent substance. Tetanus toxin is very poisonous, but anatoxin can be given in large doses without provoking any reaction demonstrable clinically. Yet it confers an active immunity of permanent, or at any rate long, duration. The principles governing the conversion of toxins into anatoxins are applicable to a large group of poisons, whether they be derived from the vegetable or the animal kingdom—e.g., from bacteria, plants, or snakes. In each case a substance is obtained which is at the same time innocuous and capable of conferring permanent active immunity on the recipient. In one series of experiments Dr. Zoeller and Dr. Ramon gave a subcutaneous injection of 0·5 or 1 c.cm. of anatoxin tetanus to human beings. A month later the serum of the vaccinated was only slightly more effective than control serum in protecting guinea-pigs from a fatal dose of fresh tetanus toxin. But a month after a second injection of anatoxin the serum of the vaccinated was from one to ten times more effective than that of control serum; and eight days after a third injection of anatoxin the serum of the vaccinated was from 500 to 3000 times more effective than the control serum. It was also found that anatoxin could be given with antityphoid (T.A.B.) vaccine, without the one interfering with, or neutralising, the other. Indeed, it would seem that the reaction provoked by the antityphoid vaccine promoted the action of the anatoxin. In another series of experiments it was found that tetanus serum could be given simultaneously with tetanus anatoxin; in other words, active and passive immunisation may be practised simultaneously. As some time is required to establish active immunisation, we cannot yet dispense with the present system of passive immunisation; but the authors of this communication foresee that in future campaigns soldiers will be vaccinated with tetanus anatoxin at the same time that they are vaccinated against typhoid and paratyphoid fever. The two first injections of anatoxin can be given with the typhoid vaccine, and as soon as a wound is inflicted the soldier can be given a third injection of anatoxin, the effect of which will be very potent in a few days. The debate at the Académie which followed this communication merely served to stress its importance, and the only discord was produced by conflicting claims for priority in the discovery. Although the facts quoted are extremely interesting and may be of great general importance in the production of active immunity, it is doubtful if their application to the particular infection is of practical moment. Tetanus is, happily, so rare a condition in civilian life that its prevention by toxin inoculation is outside the range of practicability. The modified toxin may, however, prove very useful in the manufacture of antitoxin and in some kinds of veterinary practice.

[1] THE LANCET, Jan. 23rd, 1926, p. 197.

THE OPTICAL CONVENTION.

THE first Optical Convention was held in 1905; the second, and last, was held in 1912. The time indeed seems ripe for another review of the achievements of British science and industry as applied to optics, and to take note of the remarkable advances that have been made during and since the war. How great these advances are it is the object of the convention to show. In the opinion of the organisers there has never been a time of more rapid progress, and the difference between the present position of optics in this country and the position before the war is not sufficiently recognised. Great Britain, it is claimed, has gone far towards regaining her old position of leadership. The first convention, it may be recalled, met under the presidency of Sir Richard (then Dr.) Glazebrook; the second under that of the late Prof. Silvanus P. Thompson: in 1926 the president will be Sir Frank Dyson, the Astronomer Royal. The long list of distinguished vice-presidents is suggestive of the number of sciences concerned in the advance of this key science of optics, and is also a guarantee that the convention will be of wide interest as well as of importance to specialists. The programme gives the same assurance. Apart from the exhibition and lectures there will be a large number of papers on scientific and technical subjects, included under the headings of optical theory, history and education, optical glass and the manufacture of optical elements; astronomy, microscopy, spectroscopy, and interferometry; photography, ophthalmology and spectacle manufacture; cinematography and projection; colour; photometry and illumination; surveying, including aerial surveying; and optical apparatus in the fighting services. There will also be special discourses which are to include popular lectures, and there will be a large exhibition arranged in sections called experimental and research, historical and commercial. The first section will contain exhibits by individuals, research laboratories, and institutions; the second will include the reproduction of historical experiments, whilst the third will be made up of exhibits by British manufacturing firms in all branches of the optical trade. Not even optical delusions will be neglected, and Captain Clive Maskelyne is amongst those who have promised their aid for purposes of entertainment. As before, a volume of Proceedings will be issued, and this, like the previous ones, should prove a valuable document, showing, as it will, the present state of the science in this country. The convention is to be held at the Imperial College of Science and Technology in South Kensington, London, and will last from April 12th to 17th. Applications for information or membership

should be addressed to the secretary, at the offices of the convention, 1, Lowther-gardens, Exhibition-road, London, S.W. 7. The appearance of such a convention is almost as uncommon as that of a comet, and its rarity, as well as its intrinsic interest, ought to commend it to the educated public.

DERWENT WOOD.

MEDICAL men will have personal reason to regret the death of Mr. Francis Derwent Wood, R.A., the well-known sculptor, which occurred at a London nursing home on Friday last as a sequel to a severe operation. Derwent Wood was a true cosmopolitan, for, born of an American father and an English mother, he was educated in Switzerland and Germany, and married a famous Australian singer; but his work as a sculptor was done in this country, where he had taught in the Glasgow art schools and in the two famous metropolitan schools, the Royal College of Art, South Kensington, and the Slade School, as well as at the Royal Academy. He was a frequent exhibitor at the Academy both of portraiture and imaginative work, was elected A.R.A. in 1910, and R.A. ten years later. During the war he became associated with medicine as a constructor of face-masks for disfigured soldiers, and in the columns of THE LANCET he described very fully the use of these masks in the mutilations of facial wounds. Disclaiming any attempt either to alleviate suffering or to restore function, he described his work as beginning where that of the surgeon is completed. It was the mental distress of physical deformity which Derwent Wood's work was designed to relieve, his cases being generally those extreme ones that plastic surgery had been compelled to abandon. The psychological effect was what he aimed at with the fullest sympathy, and many a patient behind one of these masks acquired the old self-respect and self-reliance, discarding despondency under the feeling that his presence was no longer a source of melancholy to himself nor of sadness to others. "So far as my treatment goes," the sculptor wrote in our columns, "the size of the areas affected is negligible. In theory, it is as easy to make a mask for a whole face as for a space an inch square to cover a small palpitating area such as is often done in the case of skull wounds. The essential of the treatment is the restoration of features; the features may have been originally ugly or beautiful. As they were in life so I try to reproduce them, beautiful or ugly; the one desideratum is to make them natural." On all hands Derwent Wood was allowed to be one of the finest plastic workers modern art has known.

TRANSMISSION OF DENGUE BY MOSQUITOES.

THAT dengue is carried by mosquitoes has long been the impression of those who have suffered from both. Lieut.-Colonel J. F. Siler and two other officers of the Medical Corps, U.S. Army, have subjected the question to experiment in the Philippines, and they now report that dengue is carried by *Aëdes egypti* (commonly called *Stegomyia fasciata*), the mosquito that transmits yellow fever. A brief note of their work appears in the *Military Surgeon* for January, the complete account being reserved for the *Philippine Journal of Science*. The 64 volunteers who participated in the research were soldiers recently arrived from the United States and free from disease, including syphilis. They were put to live in a military hospital in Manila, in a ward specially made mosquito-proof and kept mosquito-free. Experiments were made with two mosquitoes, *A. egypti* and *Culex quinquefasciatus*. With the latter the results were negative, but out of 111 experiments with *A. egypti* 47 were successful. The mosquitoes used were grown in captivity from the egg upwards. Fertilised females were put to bite dengue patients, and the sated insects were then allowed to bite the volunteers. Thus it was learned that a case of dengue was infectious to the mosquito from 18 hours before onset to the end of the third day of the disease. The *A. egypti* itself does not become infective for 11–14 days, but then remains so for the remainder of life, certainly up to 75 days; infection is not transmitted to the offspring. A patient, bitten by 2–10 infected mosquitoes, develops dengue in from 4–10 days, usually within six. Passage of the virus six times from man to mosquito and again to man neither attenuated nor increased its virulence. The whole research was well planned and carefully carried out, and the complete report will be awaited with interest.

The Services.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. and Bt.-Col. Sir E. S. Worthington retires on retd. pay.

Maj. R. G. Meredith is placed on the half pay list on account of ill-health.

The undermentioned Capts. to be Majs.: T. O. Thompson, J. G. Gill, S. M. Hattersley, and J. W. C. Stubbs (Prov. and remains secd.).

Temp. Lts. J. M. Johnston, R. J. G. Hyde, and A. K. J. Finch to be Lts. on probation, and relinquish their temp. rank of Lt.

R. V. Franklin to be Lt. on probation and is secd.

ARMY RESERVE OF OFFICERS.

Capt. N. Kerr, from T.A., Gen. List, Edinburgh University Contgt., O.T.C., to be Capt.

TERRITORIAL ARMY.

C. W. F. Greenhill (late Surg. Lt., R.N.) to be Capt.

2nd Lt. T. F. Greenhill (late H.L.I.) to be Lt.

Supernumerary for Service with the O.T.C.: H. E. A. Boldero (late R.A.M.C.) to be Capt. for service with medical unit, University of London O.T.C.

J. F. Smith (late Surg. Lt., R.N.) to be Capt. for service with medical unit, University of London O.T.C.

ROYAL AIR FORCE.

E. J. Jenkins is granted a short service commission as a Flying Officer for three years on the Active List.

Tempy. Lt. H. R. Peek, General List, Dental Surgeon Army, is granted a temporary commission as Flying Officer on attachment to the R.A.F.

MILITARY HOSPITALS RESERVE.

The reorganisation of the "Home Hospitals Reserve," under the designation of "The Military Hospitals Reserve," has been approved and the qualifications for enrolment have been issued in an Army Order. This Reserve will consist of warrant and non-commissioned officers and privates only, with an authorised establishment of 2000. The functions of the reserve will be (*a*) to staff the military hospitals and other establishments maintained by the regular medical services upon the mobilisation and withdrawal of the regular R.A.M.C. for duty in the field; and (*b*) to provide reinforcements for the medical units of the expeditionary force overseas after mobilisation. Membership will be entirely voluntary and the personnel will be provided by the St. John Ambulance Brigade for England and Wales and Northern Ireland and the St. Andrew's Ambulance Corps for Scotland.

The age limits for enrolment will be from 19 to 40 years of age, and no member will be permitted to remain in the Reserve after he has reached the age of 45 years. Every applicant must be in possession of the first-aid certificate recognised or granted by the St. John Ambulance Association or St. Andrew's Ambulance Association, and, in addition, obtain a nursing certificate recognised by those bodies within a period of 12 months after enrolment. A proportion of the total establishment of each rank in the Reserve will, in annual rotation, receive training for eight days under military arrangements. A member of the Reserve will receive, both during training and on coming up for duty in replacement of a member of the R.A.M.C., pay and allowances at the rates laid down for a man of the corresponding army rank and trade group (if qualified) whom he has been detailed to replace on mobilisation, and promotion to fill the authorised establishment of ranks during service in the Reserve will be given according to service, merit, and qualifications.

Surg.-Maj. R. Vella, half pay list, late R. Malta Artillery, on attaining the age limit for compulsory retirement, is placed on retd. pay.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CLXII.

THE TREATMENT OF CHRONIC TONSILLITIS.

II. TONSILLECTOMY IN ADULTS AND CHILDREN.[1]

Preparation of the Patient.

THE child or adult should be admitted to hospital in the afternoon before operation. Unfortunately, owing to the lack of sufficient hospital accommodation, most children have still to be operated upon as out-patients. The heart, lungs, and urine should be examined. Castor oil or other purgative is given at night and weak tea or bovril on the morning of operation.

Enucleation by Guillotine.

The Whillis-Sluder method of guillotine enucleation is as follows: (1) The patient lies in the dorsal position with the head hanging over the end of the table or with the shoulders supported by pillows and the head fully extended in good light. (2) When the patient is anæsthetised the gag is opened. (3) The operator depresses the tongue with Lack's spatula and exposes the lower pole of the left tonsil, the surgeon's left hand holding the guillotine. (4) The ring of the guillotine is hooked round the lower pole, the blade side next to the tonsil. (5) The tonsil is now pressed from below and behind upwards and forwards over the alveolar eminence of the mandible until the anterior faucial pillar and palate bulge forwards. (6) A finger of the disengaged right hand is placed on this bulging and the tonsil pushed firmly through the ring of the guillotine. In this process the tonsil is turned outside in, or "fliped" as we say in Scotland. As a rule it goes through the ring with a distinct jerk and the tip of the finger comes in contact with the ring of the guillotine. (7) The blade of the guillotine is now pushed home. (8) With a twisting movement the tonsil is removed from the mouth on the reverse surface of the instrument. (9) The anæsthetist now inserts a swab, held in curved forceps, into the tonsillar fossa. The surgeon changes the guillotine to his right hand and enucleates the right tonsil.

The child is now rapidly turned over into the prone position so that blood may run out of the mouth and, in order to assist in the control of hæmorrhage, cold water is poured with a marine sponge over the back of the child's neck. Within about 60 seconds the child, supported by a nurse, is able to sit up on the table with its legs dangling over one side. The child is then made to blow through each nostril alternately, in order to get rid of the blood which has accumulated in the nose. By this time it will usually be found on inspection that the hæmorrhage from the tonsil fossa has ceased and the child can be carried back to bed, where it is placed well over on one side with its head supported at the edge of two pillows and the face turned downwards over a shallow basin. As a rule the patient very soon goes to sleep.

Very little in the way of after-treatment is necessary. On the day of operation drinks of cold water are all that is really necessary, though some surgeons allow ice-cream, which is very popular with the patients. Thereafter porridge and milk, custard and soft foods are given, until gradually the child returns to normal diet. A purgative is given on the second night after the operation. The patient should stay in bed for two days. On the third day the child is allowed to get up and to go home on the fourth. E. Watson-Williams has pointed out that the risk of complication is far greater if patients are sent home shortly after operation. A mild antiseptic mouth-wash and gargle, such as phenol sodique, should be used for a week; 10 gr. of aspirin stirred in a tumblerful of lukewarm water and used as a mouth-wash or gargle often seems to relieve the pain.

[1] An article on the Choice of Methods in Chronic Tonsillitis by Mr. Fraser appeared last week.

Enucleation by Dissection.

Enucleation by dissection can be done in adults with the aid of local anæsthesia. The method is as follows: (1) Hypodermic injection of heroin and atropine half an hour before operation. Spray throat with 10 per cent. cocaine, taking care that patient spits it all out. (2) The surgeon sits on a high stool with his back to the window, while the patient sits in a chair facing the window. On a dark day reflected light from a forehead mirror should be used. (3) Depress the tongue and, with tonsil syringe and curved needle, inject the anterior and posterior pillars with the local anæsthetic solution (adrenalin (1–1000) ℥ 4; novocaine (1 per cent.) ℥ 60; sterile saline solution ʒ iii). Then grasp tonsil with vulsellum, pull it inwards and inject with straight needle into tonsil bed, lateral to the anterior pillar—i.e., between tonsil and superior constrictor. Lastly, the posterior palatine nerves are injected at the foramen. (4) Wait 10 to 15 minutes. (5) Insert tongue depressor and, with sickle-shaped knife held in left hand, make incision low down just behind left anterior pillar and run the knife up to junction of pillars. (6) Remove spatula and insert self-retaining depressor; grasp tonsil with uterine vulsellum, and pull it inwards while an assistant with a retractor hooks the anterior pillar out of the way. (7) With scissors curved on the flat clip around the tonsil, keeping close to the bluish-white capsule. The upper pole of the tonsil soon comes into view. Then draw tonsil forwards and snip behind it so as to free the tonsil from the upper part of posterior pillar. (8) Insert tonsil enucleator or fore-finger between tonsil and fascia of superior constrictor to separate tonsil from its bed. (9) Reinsert pillar retractor and free tonsil from lower part of anterior and posterior pillars. (10) Pass cold wire snare over vulsellum and upper part of tonsil down to lower pole. Keep up traction with vulsellum and gradually tighten snare till tonsil is detached and removed. (11) Clean out tonsil fossa with swab soaked in peroxide solution and held in curved sponge-holder. Then examine tonsil bed to see that it is clean and dry. The right tonsil is now dealt with on the same lines.

In most cases there is no bleeding after the operation has been completed, but, if there is, a peroxide swab should be inserted into each tonsil fossa, while the patient continues to sit upright. Many surgeons prefer general anæsthesia—e.g., intratracheal ether—for enucleation of the tonsil by the dissection method.

Complications.

Hæmorrhage.—Statistics vary very greatly as regards the frequence of serious hæmorrhage after tonsil enucleation. This may be explained by differences in the type of operation performed. Some surgeons say that hæmorrhage is more common after tonsillectomy than after the old slicing operation; others take the opposite view. There is general agreement, however, that severe bleeding is more common after enucleation by dissection under general anæsthesia than after the guillotine operation. This is probably because the latter is usually carried out in children. The accuracy with which cases are followed up and the personal equation are also important. Mollison had only 0·147 per cent. of hæmorrhage in 2000 cases, whereas McKinney and also Beaman Douglas reported 6 per cent. and Holger Mygind 8 per cent. The average appears to be from 0·5 to 2 per cent. Loeb has collected 62 cases in which death occurred from hæmorrhage. Vomiting of blood—altered or red—is very often the first warning that hæmorrhage is taking place. Extreme pallor and marked restlessness are other signs. As a prophylactic measure, calcium chloride may be given for two days before operation, or 10 c.cm. of horse serum may be injected. When hæmorrhage occurs the patient should sit up, supported by pillows, and light should be reflected into the mouth. A tonsil fossa full of coagulum is almost certainly the site of the hæmorrhage. The clot must be turned out and the fossa inspected to see if a piece of tonsil has been left; if so it should be removed. A swab, wrung out of hydrogen peroxide, friar's

balsam, or carbolised resin, is now packed into the tonsil fossa, held there with the sponge-holder and changed as required. Usually this is sufficient to stop the bleeding. If, in spite of these measures, the hæmorrhage goes on, the bleeding vessel should be grasped with artery or tissue forceps, which may be left on for a time, or a thread ligature may be applied—often a matter of considerable difficulty. As an alternative the Watson-Williams or other form of well-padded tonsil clamps may be used. Suturing the pillars over a roll of gauze has been employed. As a last resort the patient may be made to stand up till he feels faint. In very severe cases transfusion of gum saline or of blood may be called for.

Sepsis.—Serious septic complications following tonsillectomy are rare, though some œdema of the uvula is very common. The chief complications attributable to septic infection after tonsillectomy are pneumonia, lung abscess, and empyema. Abscess of the lung and empyema may be due to inspiration of infected material at the time of operation (here the abscess—usually in the right lung—develops within 36 hours), or to blood infection—i.e., through the pharyngeal plexus to the right heart and so to the pulmonary artery. These cases are most common after dissection under a general anæsthetic in which the operation is prolonged and there is much forcible swabbing of the tonsil fossa. In these cases the abscess develops later—in from four days to two weeks. Surgical scarlet fever sometimes follows tonsillectomy and is probably due to streptococcal septicæmia.

Results of Tonsillectomy.

Recurrent attacks of tonsillitis are, of course, eliminated if the tonsils are enucleated. E. D. D. Davis states that a family doctor had informed him that during 18 months after operation he had not been asked to visit any of 30 children who had had their tonsils removed, whereas before the operation his visits had been frequent. In Edinburgh it is not uncommon for a mother of her own accord to bring up to the Royal Infirmary a second and, later, a third child for operation, because she has recognised the symptoms of throat trouble and has seen the good results of operation on her first child. It is wrong to tell a parent that tonsillectomy and removal of adenoids will prevent the child from catching cold, but right to state that colds will probably be less frequent and of shorter duration.

Local Results.—Asymmetry or adhesion of the faucial pillars are common, but insufficiency of the palate, with cleft palate voice and return of fluids by the nose, is very rare. Dryness of the throat is sometimes complained of and is probably due to injury to the ducts of the mucous glands in the soft palate which open just above the tonsil. In singers, if the tonsil enucleation be carefully done and if the patient refrains from using the voice for two months, the results are most satisfactory. As regards chronic simple inflammatory enlargement of the tonsillar gland, Crowe reports that in 33 per cent. the enlargement disappeared after tonsillectomy and in a further 50 per cent. the glands were only the size of a pea.

Remote Results.—Although the tonsils are an important source of focal infection, tonsillectomy does not always bring about a cure of the disease for which the operation was undertaken. In chronic toxæmia, with lassitude, anæmia, and anorexia, the results in well-selected cases are excellent. The results of enucleation in cases of early arthritis and myositis are very satisfactory and often brilliant (30–80 per cent. cures). In cases of rheumatic fever, St. Lawrence states that 84 per cent. showed a good result; on the other hand, Hunt and Osman reported that the percentage of recurrence was much the same in operated and non-operated cases. In rheumatoid arthritis, not only are the ultimate results very disappointing, but patients may have to stay in hospital for three months before they recover from the effects of the operation.

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Special Articles.

BASIC QUININE AND OTHER ALKALOIDAL INJECTIONS.

BY W. H. MARTINDALE, PH.D., PH.CH.

HITHERTO it has been customary when introducing alkaloids into the tissues or into the venous circulation to employ them in the form of their soluble salts, but I think the scientific view is tenable that their therapeutic action depends almost entirely on the alkaloidal base which is liberated from the salt by the alkalinity of the body fluids. In the case of several alkaloids it has been experimentally verified in my laboratory that on mixing a solution of an alkaloidal salt with blood a considerable amount of base can be extracted by a suitable solvent. It is difficult to say who first pointed out the reaction which occurs, but Overton [1] has suggested that, in the organism, the salts of the alkaloids are split up by the alkali of the blood and lymph, their action being due only to the free alkaloids. No general clinical use of the knowledge has been made, due, no doubt, to the difficulty of making suitable solutions of these bases. The statement of Overton led Gros [2] to compare the anæsthetic effect of some bases and their salts, and in nearly every instance the base was shown to be considerably more active. Furthermore, some time ago I found the injectio cocainæ et sodii bicarbonatis, which is known to be more effective than an ordinary cocaine hydrochloride solution of the same strength, to contain the cocaine actually in such a form that it can be readily extracted as base by an immiscible solvent. Viewed chemically, this would, perhaps, not have been expected. The finding of this basic cocaine fitted in with certain views on the subject of "activated" alkaloids, which need not be dealt with in detail here.

The Use of Alkaloidal Bases.

In view of the above statements, I am inclined to think that the use of the alkaloidal bases would be preferable to that of the salts, if suitable solvents could be found. In the spring and summer of 1924 I was fortunate in finding a hospital clinician willing to try several alkaloidal base preparations—e.g., atropine, morphine, and codeine. (There is a description of the work in the "Extra Pharmacopœia," Vol. I.). Although it was only possible to give small amounts of these alkaloidal bases, they were found in some cases to have the effect of much larger doses of the salts. The great difficulty is, of course, that all these bases are only slightly soluble in aqueous or other diluents which can reasonably be employed for injection. It may be recalled that Warrington Yorke [3] did clinical work with quinine base in a sesame oil and alcohol medium, but this does not quite meet the case. My view is that one should try to find some type of solution of the basic alkaloid, capable of ready dispersion through the body fluids. A. J. Copeland [4] and H. E. F. Notton, in their search for an anæsthetic more satisfactory than cocaine, have failed, I think, to acknowledge adequately the researches of Gros. They have reintroduced his suggestion to employ a readily hydrolysed alkaloidal salt, and, founded on this idea, a preparation of novocain and boric acid has been brought to the notice of the profession as a new substitute for cocaine. It might be added that novocain (ethocaine) borate was examined in 1912 by Gros,[5] who found it to have the greatest anæsthetic effect of the five novocain salts tested. The borates, being the salts of a very weak acid, have the advantage of being readily hydrolysed, so that their aqueous solutions contain alkaloidal base, as in the injectio cocainæ et sodii bicarbonatis. They are, however, in general, too unstable to be extensively used.

Searching in many directions for a solvent which would allow of the preparation of a fairly concentrated solution of basic quinine for injection, one of my

assistants (S. Back, B.Sc.) suggested the use of the alkaloidal borate in conjunction with glycerin or mannitol. The two last-mentioned chemicals, in moderately concentrated solutions, convert boric acid into a stronger acid (a fact utilised in the titration of borates), and it was found that this stronger acid then combines with some of the alkaloidal bases, forming salts which are quite stable in solution. On dilution of these solutions with water the salts are rapidly hydrolysed, giving a solution of the alkaloidal base and boric acid.

Mannitol-Quinine.

From the experiments carried out with quinine, the following formula for such a solution appeared to be the most satisfactory :—

Mannitol-Quinine: *Suggested for intraculaneous or intravenous injection.*

Quinine base ..	1·2·0 g.	Mannitol	7·5 g.
Boric acid	8·4 g.	Distilled water to ..	100 c.cm.

1 c.cm. contains 0·12 g. (approx. 2 gr.) of quinine base and 0·084 g. (1¼ gr.) of boric acid.

This injection contains, therefore, doses of quinine within clinical limits in a reasonably small volume of diluent. I suggest the convenient short name "Mannitol-Quinine" for it. It is easily made by rubbing the powders together with about half the required amount of water, then adding, as the alkaloid dissolves, sufficient to produce the necessary volume. The quantity of boric acid used is approximately four molecules to one molecule of the base (borates of this kind are known to be very complex). If it be desired to sterilise mannitol-quinine, it will be found that on heating to 100° C. a deposit of the alkaloidal base is formed, but this re-dissolves on standing at the ordinary temperature for a few hours. Mannitol-quinine has been put to the test of different storage temperatures, and it would appear to be quite satisfactory on this point. It remains clear and unchanged up to a temperature of 60° C. (140° F.), and no crystallisation occurred at as low a temperature as −6° C. (21·2° F.). Mannitol-quinine is amphoteric to litmus paper, but is in reality practically neutral, the pH value being about 7. On adding water it becomes slightly alkaline, owing to the liberation of quinine base by hydrolysis. At first an opalescence, probably due to colloidal quinine base, is usually formed, but this disappears upon the addition of more water (long before there is theoretically sufficient present to dissolve the base).

This suggests the use of a dilute intravenous mannitol-quinine, made by the dilution of 1 c.cm. of the concentrated solution to 10 or 20 c.cm., just prior to injection. A small point which needs obvious mention is the possibility of the cumulative effect from the 1½ gr. of boric acid, if repeated; but this is, perhaps, negligible. It would, however, need watching (novocain borate contains 47·1 per cent. boric acid; the 0·1 g. tablets of commerce containing nearly ¾ gr., to be dissolved in 5 c.cm. of diluent). The addition of mannitol to injections is occasionally referred to and recommended in the literature. For example, C. C. Holman [6] stated that he employed a 5 per cent. solution of novocain and mannitol for spinal anæsthesia.

Experiments by Admixture with Fresh Blood.

Expt. 1.—Mannitol-quinine and a solution of quinine acid hydrochloride of similar alkaloidal strength were added to samples of fresh human blood to determine what difference, if any, could be observed on the quinine solutions coming into contact with it. Quinine acid hydrochloride was chosen as a salt readily soluble in water. As the amount of blood used was small, it was not expected that the results would be quantitative, but extraction of these blood and quinine mixtures with ether showed, comfirming my previous work, that some of the quinine was actually present in the basic condition. In the case of quinine acid hydrochloride this is undoubtedly due to decomposition of the alkaloidal salt by the alkali of the blood.

Expt. 2.—The next step was to work on a somewhat larger scale, and for this purpose freshly drawn animal blood was used, the serum was centrifugalised off, and admixtures with mannitol-quinine and quinine acid hydrochloride solution of a like strength in quinine were added. Obviously, slightly different results would be obtained with entire blood, but for purposes of comparison and visibility serum was employed in this and the subsequent experiments. The blood serum was, of course, definitely alkaline to litmus, and it was noticed that incipient precipitation occurred in each instance on adding 1 c.cm. of the mannitol-quinine and of the quinine acid hydrochloride solution to 20 c.cm. of serum. I view this incipient precipitation in the light of the following suggestion :—

$$\text{Protein} + 2NaHCO_3 + \text{Quinine Ac.} \rightarrow \text{Quinine Protein} + 2NaAc. + 2CO_2 + 2H_2O$$

On further addition of the two solutions to these amounts of blood serum the preparation with the mannitol-quinine addition naturally remained alkaline throughout, whereas in the case of the quinine acid hydrochloride solution about 3 c.cm. were sufficient to render the serum definitely acid.

Expt. 3.—The work was repeated on a subsequent occasion using larger quantities of fresh serum, the idea being to simulate to an extent what happens in vivo. There was no marked difference, so far as the precipitation was concerned, but ether extraction of the *clear fluids* (before precipitation) showed that approximately 33–38 per cent. of the quinine, added as quinine acid hydrochloride, was removable *as base*, but in the case of the mannitol-quinine as much as 75 per cent. of basic quinine was extracted from the serum.

Expt. 4.—In one instance excessive quantities of the quinine solutions—10 c.cm. to 60 c.cm. of serum—were added. After the addition of the 10 c.cm. of quinine acid hydrochloride solution the serum was definitely acid. In each case the serum was turbid, a precipitate forming after standing some hours. (It may be mentioned as interesting that a hydrochloric acid solution of the same strength in acid as the quinine acid hydrochloride solution, when added to the serum, did not cause any marked precipitation, whereas a 10 per cent. hydrochloric acid solution did.) The amount of the total quinine added which could be extracted as base in this experiment from the serum containing mannitol-quinine was 53·0 per cent., but with the quinine acid hydrochloride mixture was only 5 per cent. This hyper-acid experiment constitutes an extreme case; the object was merely to determine what would happen in such an instance.

The matter is by no means concluded with these results, but the evidence from the various experiments conducted is clearly in favour of the use of such a preparation as mannitol-quinine. Experiments on hæmolysis would be of interest.

Medical men will, no doubt, grasp the trend of the whole investigation, and, if I may say so, its importance, because hitherto quinine salts injected have frequently caused actual necrosis, due no doubt to the *nature* of the salts used, and to the fact that actually a double chemical decomposition has to take place at the site of injection before the quinine can begin to act. Quinine is deposited, as such, at the site of the injection. Such quinine, I am told, could sometimes be cut out with the knife, and obviously could have no immediate antimalarial or other efficiency, because it had not dispersed through the tissues and was therefore incapable of action.

It has been shown experimentally, as described above, that when mannitol-quinine comes in contact with blood, a large proportion of the quinine (larger than in the case of quinine acid hydrochloride) is present in solution in the basic condition, and therefore in all probability is more readily absorbed. Whether the injection would show less deposition of quinine at the site of injection than the salts customarily used can only be determined by section-cutting, or, indeed, clinical use. There would certainly seem to be a distinct advantage in the administration of a basic preparation, since T. A. Henry and H. C. Brown [7] found that quinine base was considerably more active against free-living protozoa than the hydrochlorides, and J. A. Sinton [8] has stated that better results are given in malaria by the use of alkalis with the quinine. H. Acton [9] has also recorded the increased activity of the salts towards paramœcium in presence of alkali, and has concluded that, for injection, quinine base would be probably more efficient than the salts, and possibly non-irritant "if a means could be devised for injecting it in solution in this form."

Toxicity Experiments.

Some experiments, kindly conducted for me by Major H. C. Brown, showed the toxicity to mice,

intravenously, of the two solutions of quinine acid hydrochloride and mannitol-quinine, suitably diluted 12 or 24 times to be approximately the same—namely, about 1 c.cm. per kilo body-weight (equivalent to approx. 120 mg. of quinine per kilo). Mannitol-quinine was slightly the more toxic of the two. Experiments on mice with mannitol-quinine in the undiluted form could not be conveniently conducted, owing to the difficulty of measuring the small volume of the solution. I have been unable to trace data as to the toxic dose of boric acid intravenously in recent medical literature, hence, on this count alone, the results of these experiments are valuable.

It would labour the subject to incorporate the numbers of suggestions and experiments which have been made for several years past in my laboratories on the problem—the bulk of them fruitless. For example, any idea of employing a quinine salt and sodium bicarbonate on the lines of the cocaine and sodium bicarbonate injection, using every conceivable type of "protective," proved quite hopeless. Again, some weak acids, like glycine, had to be excluded by reasons of poor solubility of their salts.

Glycerin instead of Mannitol.—Glycerin has been mentioned as a possible substitute for mannitol. This appears to behave similarly, but a large proportion is needed, and on the whole the mannitol (though more expensive) seems to meet the requirements.

Conclusions.

1. A formula for a reasonably concentrated solution of quinine salt (containing 12 per cent of quinine base) is given which contains the quinine virtually in the basic condition. 2. In view of the work of H. Acton, T. A. Henry and H. C. Brown, and others, the quinine in this form should be more potent. Though, as yet, no clinical trials on man have been made with it, my enthusiasm prompts me to publish this note. Perhaps other workers in the same field can make further suggestions. Animal experiments show that mannitol-quinine is practically no more toxic than a quinine acid hydrochloride solution of similar strength. 3. Mannitol-quinine may be suitable for hypodermic injection, and as such, or on further dilution, may be useful intravenously. 4. The solutions of the majority of quinine salts are distinctly acid, whereas mannitol-quinine has the advantage of being neutral, or only slightly alkaline. 5. Quinine salts (and mannitol-quinine) and other alkaloidal salts, on admixture with blood serum, yield the quinine and other alkaloids in basic condition to the serum, and mannitol-quinine shows a larger proportion, by experiment, of quinine base actually distributed. 6. It may be possible to utilise mannitol or glycerin on similar lines in the case of the borates of many other alkaloids.

PS.—Since sending this paper for publication, it has been noted that H. W. Acton and R. N. Chopra (*Indian Journal of Medical Research*, October, 1924) do not favour the injection of the salts of the cinchona alkaloids. They found that the hydrochloric acid radical of a cinchona alkaloidal salt causes œdema, irritation, and pain, and that the base, acting as a protoplasmic poison, causes death of the tissues. The neutral mannitol-quinine, described in my paper, obviates the effects produced by the very acid alkaloidal salts usually employed, and I am of the opinion that the quinine base in this preparation, being in solution, cannot be so destructive to the tissues at the site of injection, owing to its ready miscibility and diffusibility, as the suspension of the base tested by Acton and Chopra.

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ADMINISTRATION OF MORPHINE AND HEROIN.

PRECAUTIONS TO BE OBSERVED BY THE PRACTITIONER.

THE Departmental Committee on Morphine and Heroin Addiction, appointed by the Ministry of Health in September, 1924, was asked

"to consider and advise as to the circumstances, if any, in which the supply of morphine and heroin (including preparations containing morphine and heroin) to persons suffering from addiction to those drugs may be regarded as medically advisable, and as to the precautions which it is desirable that medical practitioners administering or prescribing morphine or heroin should adopt for the avoidance of abuse, and to suggest any administrative measures that seem expedient for securing observance of such precautions,"

and the reference was extended later to include consideration and advice

"whether it is expedient that any or all preparations which contain morphine or heroin of a percentage lower than that specified in the Dangerous Drugs Acts should be brought within the provisions of the Acts and Regulations and, if so, under what conditions."

The Committee consisted of Sir Humphry Rolleston (chairman), Sir William Willcox, Dr. J. W. Bone, Dr. R. W. Branthwaite, Dr. G. M. Cullen, Prof. W. E. Dixon, Dr. John Fawcett, Dr. Adam Fulton, and Dr. J. Smith Whitaker, with Dr. E. W. Adams and Mr. R. H. Crooke (secretaries).

Section IV. of the report, which has just appeared (H.M. Stationery Office, 1*s.*), deals with the precautions to be observed in the administration of morphine or heroin. The position of a practitioner when using morphine or heroin in the treatment of persons who suffer from addiction to either of these drugs obviously differs in several important respects from that in which he is placed when using the drug in the ordinary course of his medical practice for the treatment of persons not so affected. Not only will the objects of treatment usually differ, but also the dangers to be avoided, and the precautions that are therefore necessary.

Precautions in the Treatment of Addicts.

Morphine or heroin may properly be administered to addicts in the following circumstances—namely, (*a*) where patients are under treatment by the gradual withdrawal method with a view to cure; (*b*) where it has been demonstrated, after a prolonged attempt at cure, that the use of the drug cannot be safely discontinued entirely, on account of the severity of the withdrawal symptoms produced; (*c*) where it has been similarly demonstrated that the patient, while capable of leading a useful and relatively normal life when a certain minimum dose is regularly administered, becomes incapable of this when the drug is entirely discontinued.

Gradual Withdrawal Method.—In these cases the primary object of the treatment is the cure of the addiction, if practicable. The best hope of cure being afforded by treatment in a suitable institution or nursing home, the patient should, if possible, be induced to enter such an institution or home. If he is unable, or refuses to adopt this course, the practitioner must attempt to cure his condition by steady, judicious reduction of the dose. The general lines of the treatment, as carried out by practitioners of special experience, are described in the report. For success it is necessary that the patient should be seen frequently, be under sufficient control, and be in the care of a capable and reliable nurse. The practitioner should endeavour to gain his patient's confidence, and to induce him to adhere strictly to the course of treatment prescribed, especially as regards the amount of the drug of addiction which is taken. This last condition is particularly difficult to secure, as such patients are essentially unreliable and will not infrequently endeavour to obtain supplementary supplies

of the drug. If, however, the practitioner finds that he cannot maintain the necessary control of the patient, he must consider whether he can properly continue indefinitely to bear the sole responsibility for the treatment.

When the practitioner finds that he has lost control of the patient, or when the course of the case forces him to doubt whether the administration of the drug can, in the best interests of the patient, be completely discontinued, it will become necessary to consider whether he ought to remain in charge of the case and accept the responsibility of supplying or ordering indefinitely the drug of addiction in the minimum doses which seem necessary. The responsibility of making such a decision is obviously onerous, and both on this ground and also for his own protection, in view of the possible inquiries by the Home Office which such continuous administration may occasion, the practitioner will be well advised to obtain a second opinion on the case.

In Apparently Incurable Cases.—These will include both the cases in which the severity of withdrawal symptoms, observed on complete discontinuance after prolonged attempted cure, and the cases in which the inability of the patient to lead, without a minimum dose, a relatively normal life appear to justify continuous administration of the drug indefinitely. They may be either cases of persons whom the practitioner has himself already treated with a view to cure, or cases of persons as to whom he is satisfied, by information received from those by whom they have been previously treated, that they must be regarded as incurable. In all such cases the main object must be to keep the supply of the drug within the limits of what is strictly necessary. The practitioner must, therefore, see the patient sufficiently often to maintain such observation of his condition as is necessary for justifying the treatment. The opinion expressed by witnesses was to the effect that such patients should ordinarily be seen not less frequently than once a week. The amount of the drug supplied or ordered on one occasion should not be more than is sufficient to last until the next time the patient is to be seen. A larger supply would only be justified in exceptional cases, for example, on a sea voyage, when the patient was going away in circumstances in which he would not be able to obtain medical advice. In all other cases he should be advised to place himself under the care of another practitioner, who should be placed in communication with his previous medical adviser in order that he might be informed as to the nature of the case and the course of treatment which was being pursued.

A practitioner when consulted by a patient not previously under his care, who asks that morphine or heroin may be administered or ordered for him for the relief of pain or other symptoms alleged to be urgent, should not supply or order the drug unless satisfied as to the urgency, and should not administer or order more than is immediately necessary. If further administration is desired, in a case in which there is no organic disease justifying such administration, the request should not be acceded to until after the practitioner has obtained from the previous medical attendant an account of the nature of the case. Requests from one practitioner to another for such information should obviously receive immediate attention.

Precautions in Ordinary Medical Practice.

The evidence before the Committee would appear to indicate that there has been a recent diminution in the prevalence of morphine addiction, and that this is due to the operation of the Dangerous Drugs Acts in making it difficult to obtain the drugs except from or on the prescriptions of doctors. This enhances the importance of consideration of the precautions that are necessary in the use of these drugs in ordinary treatment, in order to reduce to a minimum the risk that a patient may develop a craving for them. These precautions are, the Committee thinks, well recognised among competent and careful practitioners in all branches of the profession, and the conclusions here stated, based on the testimony of medical witnesses, including representative general practitioners, may be regarded as expressing fairly the opinion of all members of the profession who have given the requisite attention to the subject.

Where the patient is suffering from organic disease for the treatment of which the drugs are necessary, the matter may be considered under two aspects, (*a*) cases in which the administration of morphine or heroin may be necessary for an indefinite period and in which the probability of a cure of the disease is remote (e.g., inoperable cancer and the like), (*b*) cases in which administration of the drugs is called for in order to deal with conditions which, though due to organic disease, may be expected to be of a more or less temporary duration (such as renal or biliary colic, &c.). In regard to class (*a*), since consideration of the possibility of the establishment of a craving cannot be allowed to influence the administration of such doses of the drugs as are considered necessary for the adequate treatment of the organic disease, it will be in those rare cases only in which there is some prospect of partial or complete recovery from the disease that any attention can properly be given, during the course of treatment, to such measures as are likely to mitigate or avert the risk of subsequent persistence of any craving which may have been produced. In respect of class (*b*), the employment of these measures becomes of paramount importance. They consist mainly in the substitution, when possible, of other drugs for morphine and heroin, in close supervision by the practitioner of the amounts used and of the frequency with which they are administered, and in withdrawal of the drug as soon as the necessity for its administration has ceased.

In stating the precautions to be observed in cases other than those referred to in the preceding paragraph, the Committee has in mind, particularly, those cases in which it is thought necessary to administer, say, morphine, in such doses, with such frequency and for so long a period as may be requisite, for example, for the relief of pain after surgical operations, or in cases of severe neuralgia in which the necessary relief cannot be obtained otherwise.

In cases in which it appears that the use of morphine or heroin may be thus desirable, it must first be considered whether the purposes of treatment can be substantially as well served by other drugs that do not involve the risk of addiction. Constant attention is necessary to adjust the dosage to the varying needs of the case. The intervals at which it is desirable to see a patient (not an addict) who requires the administration of morphine or heroin will necessarily be determined by the nature of the case. In cases of chronic disease requiring a more or less prolonged administration of the drugs, the patient need only be seen at such intervals as are appropriate on other medical grounds, but in cases such as renal or biliary colic, in which the necessity for the administration may cease at any moment, it may be important to see the patient more often than would otherwise be necessary in order to guard against the production of a craving.

The quantity supplied or ordered at one time for use by those nursing the patient should not ordinarily exceed what will be required before the patient is seen again. Where any discretion is given to nurses as to administration it should be strictly limited by prescription, and any change made in the treatment should similarly be stated in writing. The practitioner will realise that the responsibility for administration is entirely his, and cannot properly be delegated to any person not medically qualified. It is desirable also that the patient should not be informed of the name of the sedative drug employed; particularly inexpedient is the handing over to the patient of original packages containing morphine tablets, or the like, which bear on their labels a clear statement of the exact amount in each tablet. Hypodermic administration of the drug by the patient to himself is to be strongly deprecated.

The use of the drug should be discontinued as soon as possible, and, if unfortunately a craving has formed, close supervision and appropriate treatment must be maintained until the medical attendant is satisfied that the patient has been rendered independent of the drug. It is to be noted in this connexion that, in the opinion of some authorities, a month's continuous administration of morphine may suffice to produce in a person who previously appeared normal a condition of addiction (as shown by withdrawal symptoms observed on discontinuance); and in persons with an inherent predisposition, administration for a shorter period may have this effect.

Most of the medical witnesses examined by the Committee concurred as to the desirability of special instruction to medical students on the precautions necessary in the use of morphine and certain other drugs in order to avoid the development of addiction. One or two medical witnesses, on the other hand, expressed doubt whether such instruction might not accentuate the undue timidity which they believed was not uncommon among practitioners. Such a result, the Committee believes, need not be feared from a full exposition of the actions, both valuable and harmful, of these drugs, the indications for their use, their proper place in treatment, the dangers to be guarded against, and the best means of averting these dangers.

CANADA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Public Health in Province of Quebec.

Dr. Alphonse Lessard, director of the bureau of health of the province of Quebec, believes that general education in matters of health is making steady progress. Partly as a result of this progress the general mortality rate, which not long ago was 17 to 18 per 1000, dropped to 13·6 in 1923 and to 12·4 in 1924. (The rate in New York State in 1923 was 13·1 and in Massachusetts 13·2.) Even stronger evidence of increasing education is found in the decrease of infant mortality. In 1923 the rate was 181 per 1000 live births, whereas in 1924, with an increased general population and a marked decrease in births, the infant mortality fell to 118. In Quebec province, in the course of a few years, there will be 1200 beds at the disposal of tuberculous patients, and 17 centres have been organised for the campaign against tuberculosis and other diseases. There are 50 baby clinics, besides the municipal baby stations in Montreal, and Dr. Lessard claims that there are some 70 institutions in the province where an increasing portion of the population receives instruction in the care of children.

Ten years ago cancer caused the deaths of 985 persons in the province of Quebec; in 1924 it caused 1554 deaths. Dr. Lessard has remarked an unexpected disparity in the death-rate from malignant disease of Canadians of French and British origin. Thus, in Richmond County 16 cases of cancer were reported among the English population of 5000, and only four cases among the French population of 15,000. A somewhat similar disparity has been found by the Health Department of Nova Scotia, and statistical investigations along these lines are to be continued during this year.

Health Work in Montreal.

The campaign against tuberculosis has made great progress in Montreal during 1925, and there are now four clinics, two sanatoriums, one observation hospital, and one hospital for advanced cases. Another hospital is shortly to be opened. There is also an open-window school, a summer camp at Ste. Agathe for the children of this school, two camps open during summer holidays within the city limits, vacation camps in the country for children in poor health, and a tuberculosis and general health league. The total number of beds available in the various institutions after the opening of the Sacred Heart Hospital will be over 600; the number of tuberculosis clinics is four. The campaign against tuberculosis by means of clinics has been centred in the two institutes, the Institut Bruchesi and the Royal Edward Institute, and each of these institutes operates two clinics. It has been agreed that the entire work of the city clinics antituberculosis campaign, including the survey of cases in homes and of contacts, shall be carried out by the institutes. Hospitals and other organisations send all their diagnosed cases to them, and private practitioners are invited to send all cases of tuberculosis found among the poor. Through their nurses, the institutes will survey homes in which there are cases of tuberculosis or where there are known tuberculosis contacts. This survey will be carried out by competent nurses who will visit the homes of the tuberculous at least once monthly and the homes of contacts at least once every two months. The institutes will also educate the patient and the family at home, search for tuberculous cases and persons who have been or who are exposed to infection, and hold special clinics for systematic medical examination of contacts, medical examination of children, and for examination during the evenings of people who work during the day. This organisation aims at keeping in touch with cases, at directing the régime of tuberculous patients, and at educating them and their families. Frequently patients cannot or will not leave home, but obviously they should be kept under observation, and their menace to public health must be minimised. That is the function of the nurses, and the clinic is a natural development side by side with the sanatorium and the hospital. It must, of course, be situated in places of easy access to the whole population.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Immigration and French Hospitals.

THE movement for restricting immigration is making rapid progress. The large numbers of irresponsible foreigners, not originating from the productive classes, cared for by the French hospitals are proving a great financial burden. The Union of Directors of Private Hospitals in France has just issued resolutions pointing out that private clinics and hospitals are gravely hampered and menaced by relatively recent legislation. The large public free hospitals now receive and treat patients at very low rates and without regard to the patients' ability to pay proper fees, and very soon private hospitals will be forced out of existence. The Union demands that no pay cases be received by the public hospitals, though in this way some of the difficulties with regard to foreigners might be met. Missoffe, a Paris deputy, suggests that indigent foreigners should be cared for by their wealthy compatriots resident in France, speaking of a fund established by Italy for creating a hospital for Italians at Paris and of the British and American hospital services in the city. Industrial communities, swamped by the foreign sick, have asked for larger budgetary allowances. The director of the French charities (Assistance Publique) has been obliged to request that 1500 beds be provided, in unused barracks, for the same reasons. The Minister of Hygiene and Labour, deputies and councillors, and the Académie de Médecine are all formulating demands that the public powers proceed at once to organise sanitary control of French immigration, and are joining hands in a vigorous effort to secure the desired reform. The regulations enforced by the United States are cited as model.

Foreigners in Lunatic Asylums.

A statistical study has been made by Marie of mentally defective foreign patients in France. During the past 18 months about 1000 such patients, of 32 different nationalities, have been interned in Paris. Most of them could not speak French and they

all seemed to have been dumped upon France to relieve their home countries. This group has been costing 20,000 francs daily. The average age of the patients is 27, and the probable survival period is 30 years, so that the final cost will work out at somewhere about 50 million francs, even if the patients be placed in rural regions to reduce the expense.

There is no doubt that a certain number of them might leave the asylums, but before this can be done everyone of them will have to have a fresh mental examination. Dr. Roubinovitch, of Paris, who speaks Russian fluently, has offered his services as an alienist to the Minister of Hygiene and the Prefect of the Seine. Many of his compatriots cannot speak French, and obviously they have to be questioned in their own language. Probably this re-examination will take place, but the patients will first have to be collected into a single institution somewhere near Paris.

The Supply of Fresh Fish.

Dr. Loir and Dr. Legangneux (both of Havre) have been studying the differences between fish preserved in melting ice, as is done on trawlers, and fish which has been kept in refrigerators, such as might be installed on larger ships which could go further afield to seas where fish is abundant. What we eat at present has been preserved in ice, but in a refrigerator it keeps the freshness that it had when it was caught. Here we have a question to look at from two points of view—the economic and the hygienic.

A Filter-passing Virus in Tuberculosis.

Some interesting experimental research on a filter-passing virus in tuberculosis and on the transmission of infection through the placenta has been published by Dr. Arloing and Dr. Dufor, of Lyons. The agent which produces tuberculosis can not only occur in the bacillary forms in which it has long been recognised and studied, but can also be found in a form which is invisible and which is so minute that it passes through the porcelain of a filtering candle. This form of virus occurs especially in the tuberculous lesions of childhood (tuberculous adenitis, tuberculosis of the lung, and tuberculous meningitis). Inoculation into a guinea-pig of filtrate from such lesions produces tuberculosis of the animal in more than half the cases. Sometimes the guinea-pig dies in a state of extreme emaciation, and typical tubercle bacilli are found in the lymphatic glands without visible lesion. Sometimes, but more rarely, it dies of tubercle of the usual type. The authors have produced intra-uterine infection in the fœtus by inoculating the mother with filtrate containing invisible tubercle virus, and their experiments are, perhaps, important in their bearing on the vexed problem of hereditary tuberculosis.

Repopulation of France.

A statement just issued by the Minister of Hygiene shows that the French birth-rate for 1924 was 19·2 per 1000 inhabitants, and that the infant mortality was 85 per 1000 live births. In 1913 the corresponding figures were 19·1 and 112. Infant mortality has thus distinctly diminished and the birth-rate is slightly more than holding its own.

The thirty-ninth French Congress on Ophthalmology will be held at Paris on May 10th. Information may be obtained from Dr. Onfray, 6, Avenue de la Motte-Picquet, Paris.

There will be a dermatological congress at Brussels from July 25th to 28th, at which there will be discussions on tuberculides, herpes zoster, purpura, syphilitic reinfection, superinfection and pseudo-reinfection, endocrine disturbances due to congenital syphilis, and the treatment of lupus and cutaneous tuberculosis.

From March 2nd onwards a post-graduate course in urological pathology and treatment is to be held at the Necker Clinic on Tuesdays and Fridays, at 4 P.M., under the direction of Prof. Legueu. Further details may be had from Clinique Urologique, Hôpital Necker, rue de Sèvres, Paris.

DENTAL BOARD OF THE UNITED KINGDOM.

A MEETING of the Board was held on Feb. 10th, the President, Mr. F. D. Acland, being in the chair. It was announced that the name of Percy Ravenscroft had been restored to the Dentists Register from which it had been erased under Section 12 of the Dentists Act. The Board received from the secretaries of the Customs House a copy of Statutory Rules and Orders 1925, No. 1240, dealing with the sale of methylated spirits, from which it appeared that dentists have been placed on the same footing as medical practitioners under the regulations.

Public Education in Dental Hygiene.

The Board adopted a report from the Dental Health Education Committee which dealt with business transacted since November last. Work in connexion with the dental health campaign has continued along the lines then laid down. New schemes of propaganda have not been initiated, but there has been a regular and increasing disposition to take advantage of the facilities offered, and it is clear that the Board's work is becoming widely known to organisations interested in public health. The Education Committee considers that the method of working through such bodies is justifying itself.

The main agents in publicity are cinema films, leaflets, and lectures, and the value of the cinema, both in giving actual instruction and in attracting the public to meetings, is becoming abundantly clear. More films have been asked for and, in conjunction with the National Baby Week Council, the Committee is preparing one which deals with the care of the mouth of the expectant and nursing mother and the infant. Requests for some 80,000 leaflets have been received since the last report; demands have been made by various insurance committees for large supplies for distribution to insured persons, and it is hoped that the approved societies will coöperate in distributing the Board's literature more widely. The offer to provide private practitioners with leaflets has evidently been appreciated, for some 500 dentists have applied for them.

Amongst the organisations with which the Board is coöperating are the Industrial Health Educational Council, through whose good offices the Board's lecturers are gaining access to the industrial classes in certain parts of Scotland; the Girl Guides; the National Council for Health, Maternity, and Child Welfare; and the National Federation of Women's Institutes. It is hoped that negotiations with the Federation will result in health lecture tours, to be arranged by the British Red Cross Society.

Other forms of propaganda have not been neglected. Progress has been made in the collection of the proposed dental health exhibit. A book for the instruction of teachers is in an advanced stage. Satisfactory publicity has been obtained in the press. The Committee believes that its efforts have already met with a notable degree of success and that serviceable work is being done at no undue cost by methods which are satisfactory to the dental profession.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 13TH, 1926.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox 253 (last week 390); scarlet fever, 1613; diphtheria, 1159; enteric fever, 43; pneumonia, 1352; puerperal fever, 62; cerebro-spinal fever, 15; acute poliomyelitis, 6; encephalitis lethargica, 61; dysentery, 6; ophthalmia neonatorum, 104. There were no cases of cholera, plague, or typhus notified during the week.

Deaths.—In the aggregate of great towns, including London, there were 2 (1) deaths from enteric fever; none from small-pox; 83 (49) from measles; 14 (2) from scarlet fever; 60 (4) from whooping-cough; 26 (9) from diphtheria; 49 (10) from diarrhœa and enteritis under 2 years of age; and 90 (16) from influenza. The figures in parentheses are those for London itself.

Public Health Services.

MENTAL HOSPITAL REPORTS.

THE fifty-fifth annual report of the *Glengall Hospital, Ayr*, records a drop of 22 in the number of inmates since the end of 1924. The superintendent reviews the figures for 30 years past and shows that the admission rate is much the same for both sexes to-day. The recovery rate was 31 per cent. for men and 57 per cent. for women, although the majority of women admitted were in a gravely exhausted state. There was some slight improvement in the physical state of the admissions last year on the male side, but on the whole the standard of physical health has steadily deteriorated for some years past, as many as 70 per cent. of the women and 42 per cent. of the men being classed as "seriously exhausted" on admission. The death-rate was 14 per cent., showing a steady increase during the last decade; half of the fatal cases were over 60. The general health of the inmates has been good, and there have been no epidemics. The hospital has a few voluntary boarders, but unfortunately there are still a number of mentally defective children who should really be in an *ad hoc* institution. Forty-one per cent. of the nurses and 33 per cent. of the attendants have obtained the certificate of the Royal Medico-Psychological Association.

The report of the Inspector of *Hospitals for the Insane in Queensland* for the year 1924 is just to hand. There are three large hospitals in the State. That at *Goodna* has 1400 patients and, of the 400 cases admitted during 1924, nearly half were suffering from the manic-depressive psychosis. There was a recovery rate of 52·6 per cent. on the admissions, the second highest rate for 16 years. The rate represents a high proportion of recoveries in the province, since curable cases of transient and incipient mental disease are received in the mental ward of the Brisbane General Hospital and so are not included in the statistical figure. The death-rate was 10·4 per cent. Senile decay was the fatal cause in a quarter of the cases, while no fewer than 12·8 per cent. died of general paralysis. Between 600 and 700 patients are employed about the buildings and grounds, chiefly in ward work and gardening or farming. At *Toowoomba* there are just over 1000 patients. Here also the manic-depressives form a large proportion (33·7 per cent.) of the total admissions during the year, but only one case of general paralysis was admitted. The recovery rate was 32·5 per cent., a lower figure than usual owing to a large number of senile dements and irrecoverable cases from the epileptic home at Willowburn. The death-rate reached the low figure of 3·8 per cent. This is the only mental hospital in Queensland that has no cinematograph apparatus. The *Ipswich Hospital* has only 450 patients, as it is a reception house for transfers from other hospitals, mainly for chronic cases from Goodna. The recovery rate is therefore low—18·2 per cent. The death-rate was 3·1 per cent. As many patients as possible are usefully employed about the hospital. There are also two reception houses, that at *Rockhampton* being only a half-way house for those arriving too late to proceed straight to Brisbane, while the *Townsville* House receives patients for observation and treatment before they go on to Goodna. About 100 such cases passed through during 1924, and 16 of them were discharged recovered. The total number of certified patients in the State at the end of 1925 was 2902, showing an increase of 25 on 1923, a proportion of 3·47 per 1000 of the total population. This corresponds with the figure in other States, the lowest being 2·24 in South Australia and the highest 3·84 in New Zealand. There is a State mental nursing certificate obtainable by examination, and a large proportion of the nurses hold this: 62 per cent. at Goodna, 44 per cent. at Toowoomba, and 72 per cent. at Ipswich.

Correspondence.

"Audi alteram partem."

PUNCTURED WOUNDS OF THE FINGER.

To the Editor of THE LANCET.

SIR,—From time to time the loss of a member of our profession is recorded as a result of a punctured wound of the finger, received during the performance of a post-mortem examination or of an operation on some acutely septic condition. In other cases not recorded irreparable damage has been done to the finger or hand sufficient to limit considerably any future work or at any rate create a serious handicap.

There were two lessons learned, or rather I should say impressed on us, during the war. The first was that excision of a wound was the best means by which to avoid a spread of sepsis, and provided this was performed early, success was met with in a large number of cases. The second was that temporary complete immobilisation of the limb, which gives the natural defences of the body the best condition under which to act, was a most valuable factor in helping to localise the results of an infection.

It is not always an easy matter to apply these two principles in civil life, and yet one cannot help feeling that adherence to them might be the means of avoiding some disasters. In my opinion a puncture wound of the finger received when there is a risk of infection should be immediately excised (after excision the wound may be closed) and the limb splinted.

It is in the very early stages only that these infections can be dealt with successfully, and though such treatment may often be considered excessive, the few days of real inconvenience it entails must be compared with the dire results that may otherwise follow. I am, Sir, yours faithfully,

London, Feb. 17th, 1926. F. D. SANER.

THE ADMINISTRATION OF CARBON DIOXIDE IN ANÆSTHETICS.

To the Editor of THE LANCET.

SIR,—The administration of mixtures of carbon dioxide and oxygen in conjunction with general anæsthetics has been practised in America for a number of years. More recently, since such mixtures are now obtainable commercially in this country, it would seem that yet another cylinder must be included in the already sufficiently cumbersome equipment of the anæsthetist; for of the value of carbon dioxide there can be no doubt. It is probable that some of the good results obtained in nitrous oxide-oxygen anæsthesia are attributable to conservancy of carbon dioxide by re-breathing. The same contention may hold good, to a lesser extent, in "perhalation" ether administration.

On the other hand, it is just possible that some of the pallor and feeble respiration occasionally associated with open chloroform anæsthesia may be due to carbon dioxide deficiency. Prof. Yandell Henderson has already dealt with carbon dioxide deficiency as a factor in the causation of shock. In endotracheal insufflation anæsthesia, where re-breathing is not practicable, the occurrence of apnœa is not uncommon. When associated, as it usually is, with light anæsthesia, this troublesome factor can be responsible for muscular rigidity and delay in obtaining the necessary depth of anæsthesia. Under such conditions it is quite possible for cyanosis to be present, even when oxygen alone is being driven through the catheter. The judicious use of a mixture of 10–15 per cent. carbon dioxide with oxygen in these cases is attended by the immediate re-establishment of the respiratory excursions and consequent attainment of the requisite depth of anæsthesia.

At the end of an operation conducted under open ether the exhibition, in a gas-bag, of a similar mixture

promotes de-etherisation and lessens post-operative nausea. This practice would seem to be of definite value at the end of a high abdominal operation, in the course of which the movements of the diaphragm are liable to be hampered. By assisting in the early re-establishment of diaphragmatic activity the mixture may well remove the tendency to stagnation at the pulmonary bases and help in the prevention of post-operative pneumonia.

In private practice the most convenient form in which to carry carbon dioxide for occasional use is the well-known "sparklet bulb." An ordinary fine adjustment valve can now be obtained from Messrs. Allen and Hanburys, Ltd., fitted with the necessary device for holding and puncturing the bulb. The gas is released into a small football bladder, from which it can be transferred as required to a gas-bag and mixed with oxygen in the proportions desired. Where greater accuracy is essential a water sight-feed fulfils the purpose.—I am, Sir, yours faithfully,

I. W. MAGILL, M.B., B.Ch. Belf.,
Assistant Anæsthetist, Westminster Hospital.

Feb. 20th, 1926.

LORD LISTER'S BIOGRAPHY.

To the Editor of THE LANCET.

SIR,—A German translation of Sir Rickman Godlee's biography of Lord Lister has been published, which claims to be "the only authorised translation." It was only "authorised" on condition that it should be approved by him before publication, and this condition was not fulfilled. As his executrix I desire it to be known that neither he nor his representatives are in any way responsible for the accuracy of it.

I am, Sir, yours faithfully,
JULIET M. GODLEE.

Whitchurch, Oxon, Feb. 16th, 1926.

A LUNG SPLINT.

To the Editor of THE LANCET.

SIR,—Under this title Dr. R. C. Wingfield has furnished a valuable contribution to the treatment of phthisis in your issue of Jan. 2nd. He points out the advantage of "limiting the movement of the diseased parts of the lung by even so little as 1 cm." and describes the method by which he attains this end.

On the desirability of limiting movement in the treatment of any lesion of the lung substance, I am entirely at one with Dr. Wingfield, a little limitation effected by some form of lung splint being at one end of the scale, and complete collapse of the lung by artificial pneumothorax at the other. The respective techniques of thoracoplasty and artificially induced pneumothorax, as recognised therapeutic measures, are more or less worked out, but the best method of restricting the movements of the lung by some form of lung splint still remains sub judice. I discussed the whole question of lung immobilisation in a paper entitled De la Compression du Poumon dans le Traitement de la Tuberculose Pulmonaire, read at the Paris Congress of Tuberculosis in October, 1905.

The point I wish now to emphasise is that the objective of treatment is not only to limit the movements of respiration but, furthermore, to relax the continuous tension on the periphery of the pulmonary lesion. We all know that an ulcer of the leg—a lesion of two dimensions only—will not commence to heal till the tension is taken off its edges. Hence, it may be assumed, a fortiori, that a cavity of the lung, which is a lesion of three dimensions, will not heal till the tension is taken off its walls. Thus, in dealing with pulmonary lesions, the problem is how to relax the peripheral pull continuously exercised by the chest wall on the lung substance—a pull which in health keeps the air cells distended while in disease it is opposed to the process of repair. Seeing that the disease is situated in the lung tissue and that the pull is exercised in every direction at its periphery, the solution of the problem is this: relaxation of the pull can be effected only by compression of the lung substance.

Compression of the lung may be either complete or relative—complete, when the lung is collapsed by effusions or pneumothorax, either spontaneous or induced—relative, when the chest cavity is reduced in size, either by natural processes of repair, by thoracoplastic operations, or by some method of chest compression. In collapse, when the lung tissues are generally and completely relaxed, the diseased area is theoretically under the best conditions for healing—an a priori conclusion confirmed by the salutary effects observed in pneumothorax, whether spontaneous or artificially induced. But there is also evidence to show that partial relaxation of the lung tends to promote healing in the diseased portion. And, apart from thoracoplastic operations—most valuable in certain cases—it remains to consider by what other means the lung tissues may be partially relaxed. This can only be effected by reducing the capacity of the thoracic cavity. Nature's methods of compassing this end are: 1. The encroachment of neighbouring organs—viz., the opposite lung and the abdominal organs—on to the domain of the diseased lung. 2. The falling in of the chest wall. 3. The development of bands of fibrous tissue radiating in many directions from the diseased area. These by their retraction not only tend to relax tension on the diseased area by their pull on neighbouring portions of healthy lung, but, when adherent to the parietal pleura, they pull in the chest wall.

How, then, can we aid Nature in this her task of reducing the size of the thoracic cavity? The cubic capacity of the chest varying with each respiratory movement, the idea of maintaining the chest cavity at its minimum suggests itself. And while it is impossible to abolish all respiratory movement, much can be practically accomplished, and, furthermore, the minimum capacity may be progressively reduced by the continued maintenance of pressure.

Where and how should this pressure be applied? In order to determine this, it is necessary to consider certain features of the thoracic cavity. It is cone-shaped, with its apex or dome upwards. The dome is less amenable to pressure than the base, being to a great extent sheltered by the shoulder girdle. The base admits of a much wider range of movement than the dome. The lung completely fills the chest cavity; in health it is uniform in structure throughout and fills uniformly with air when subjected to the peripheral pull of the chest wall, much as a sponge does when immersed in water.

With these structural and physical features in mind, let me endeavour to compare the effects of pressure applied at the apex of the lung and at the base, respectively. Pressure at the apex, by whatever method applied, to be effective must first double inwards and downwards the dome of the thoracic cavity. It will then act on the apex of the lung, tending thereby to relax the peripheral pull. But, as the general direction of the pressure is downwards, its effect must be to push downward the apex of the lung, so that a point at any level of the apex before the application of pressure must, when pressure is applied, be displaced downward in relation to the thoracic cavity. At its new level the circumference of the thoracic cone is greater and the power of the peripheral pull proportionately increased; so that the relaxation gained by direct pressure is counter-balanced by increased peripheral pull. Assuming, then, that relaxation of peripheral pull on the diseased area is the objective of treatment in pulmonary lesions, I conclude that, a priori, one cannot anticipate the best results from pressure applied at the apex.

To turn now to pressure applied at the base by means of a constricting band round the lower part of the thorax on the affected side. This not only limits the range of the respiratory movements but it thrusts the whole lung upwards, so that each point of its periphery is somewhat higher in relation to the thoracic cavity than it was before the application of the constricting band. And, being higher up, the lung

occupies a narrower portion of the thoracic cone and, consequently, there is a general relaxation of the peripheral pull. Meanwhile, the apex of the lung is crowded into the pleural dome, the narrowest and most immobile part of the thoracic cavity, and, in that position, it is subject to a minimum degree of movement and a maximum degree of relaxation.

The application of this method is very simple, and can be carried out equally well at home as at an institution. The material used is 1½ in. adhesive strapping. Of this I cut six strips, long enough to surround the lower half of the thorax, just overlapping the spines of the vertebræ behind and the middle line of the epigastrium in front. The edges of the strips I snip, so that they may adapt themselves better to the contour of the surface. The first strip is applied firmly over the tenth dorsal spine and follows a slightly descending line to about the middle of the epigastrium. While applying it I direct the patient to breathe out forcibly, and I pull it round firmly, fixing it during expiration; the second strip, just overlapping the upper margin of the first, I apply in the same way; the third strip I apply from below upwards, so that it crosses the first two and acts as a check to prevent them from slipping; the fourth and fifth slips are applied in series with and above the first and second, and the sixth is applied as a check parallel to the third. In one or two cases I tried antero-posterior strips, passing over the shoulder and interlacing with the horizontal strips, but this I abandoned, both on practical and theoretical grounds. The strapping is changed about once a week, and should be carefully removed with the aid of spirit or turpentine, so as to safeguard the skin from injury. The treatment must be continued for a considerable period. The maximum over which I maintained it was two years and, while extraordinarily rapid healing took place in several cases, some benefited but slightly and others not at all.

The treatment is of most use in the common case of disease commencing at one apex, but I have had favourable results from its use where both lungs were affected. Moreover, it possesses certain advantages over the collapse method, so that it need not be used only to "avoid drastic procedure" but because, in suitable cases, it is better.

I am, Sir, yours faithfully,
STUART TIDEY, M.D., M.R.C.P.

London, Feb. 12th, 1926.

INTRAVENOUS SOMNIFENE ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—Dr. R. K. Lambert's paper on the aliphatic compounds in general anæsthesia in your issue of Jan. 16th, and Mr. E. R. Flint's note on hedonal anæsthesia in that of Jan. 30th, show how unceasing is the search for the ideal method of anæsthesia. Recently, in France, the experimental and clinical researches of Fredet and his associates on the use of somnifene in intravenous injection for surgical anæsthesia prove that by the use of this preparation general anæsthesia may be reduced to a minimum—in some cases it may be eliminated. The effect of somnifene is somewhat similar to that of hedonal as described by Mr. Flint, but the patient becomes unconscious more rapidly, usually about three to four minutes after the injection is begun. Fredet's interesting researches demonstrate that the seat of action of somnifene is chiefly in the nerve centres; its effect on the liver and kidney is extremely small. He further found that in the commercial product of this name there are two constituents, one with a slow and needlessly prolonged anæsthetic effect. He has eliminated this body and now employs only the other—viz., allylisopropylmalinurea—whose action is rapid and more transient.

To obtain surgical anæsthesia with this product it must be combined with morphia, or with morphia and scopolamine. In some cases nothing more is needed, but generally a small amount of a general anæsthetic is used to make and to close the incision. The technique of Fredet's method is as follows:—

(1) A hypodermic injection of morphia is given, varying from a minimum of 1 cg. up to 2 cg. as a maximum. It is advantageous to associate scopolamine with the morphia in doses varying from ⅓ mg. as a minimum up to ½ mg. as a maximum according to the weight of the patient, and whether his general state is cachectic or satisfactory.

(2) Twenty minutes later as a minimum interval, or 45 minutes as a maximum, after the morphia-scopolamine injection, the intravenous injection of allylisopropylmalonylurea is made in a vein at the bend of the elbow with a fine needle and *very slowly*; three minutes at least should be spent in the injection. The dose is calculated according to weight, age, and the general state of the patient. Generally in fairly robust adults 1 cg. per kg. of body-weight is used, never passing 0·07 g. Personally, we have never passed 0·06 g. In aged or cachectic patients 0·04 or 0·03 g. should be enough. Ampoules of the drug may be obtained containing 0·01 g. in each cubic centimetre of water.

(3) Five minutes after the intravenous injection a small amount of chloroform or ether may be given to permit the incision being made about ten minutes after the intravenous injection. During the operation the general anæsthetic can often be dispensed with, to be resumed should the patient move and at the end to facilitate the suture of the wound.

This technique in practice is extremely simple, the anæsthesia is excellent, post-operative vomiting very rare. Patients awake four or five hours after operation to fall asleep quietly again. Excitement, which was frequently observed after somnifene anæsthesia when first used, is often quite absent with the latest preparation. I have used this anæsthesia in certain cases for over 18 months and, though it has not replaced routine methods, it is my choice in two types of cases—when the patient is a bad risk from pulmonary complications or from probable hepatic and renal insufficiency, and again when we are certain the operation must be prolonged. Thus I have used it in most types of gastric operations, gastro-enterostomy, gastrectomy, Balfour's operation, pyloroplasty and duodeno-jejunostomy, colectomy, and the prolonged operations needed for the case of gastro-colic fistulæ. In the tedious operation for large ventral hernia in a bronchitic patient and in exploratory operations when cancer is inoperable it has served me well. In several cases of gastro-enterostomy in most debilitated patients, by the addition of some local anæsthesia of the wall no general anæsthetic was required. In a case of colectomy of the sigmoid for a ring carcinoma neither local nor general anæsthesia was employed, the patient slept deeply, never resenting the inevitable drag of the mesentery during mobilisation of the descending colon which was anastomosed to the rectum by Mayo's tube method. He never vomited afterwards; the pulse never passed 100.

Fredet's researches and a list of cases in which this anæsthesia was employed are fully detailed in the *Bulletins de la Société Nationale de Chirurgie* for July, 1924, and March, 1925. More recently he has published (*Paris Médical*, Dec. 5th, 1925) a useful résumé of his work after an experience of about 200 cases.—I am, Sir, yours faithfully,

IAN MACDONALD, M.D.

Huelva, Spain, Feb. 10th, 1926.

SELECTION OF COD-LIVER OILS FOR MEDICINAL USE.

To the Editor of THE LANCET.

SIR,—In the joint inquiry upon cod-liver oil, conducted by Prof. J. C. Drummond and myself, I was mainly responsible for the section dealing with the Newfoundland oils and with the relation of the sexual condition and age of the cod to the potency of the liver oil. I feel, therefore, obliged to comment on the article by Prof. E. Poulsson in THE LANCET of Feb. 6th (p. 320), in which he criticises certain statements made by Prof. Drummond in the issue of Sept. 26th, 1925. As I did not see Prof. Drummond's article until it appeared in print, I do not hold myself responsible for everything stated therein.

Prof. Poulsson is quite right in asserting that the sexual condition of the cod during spawning has no bearing on the activity of the oil, as was shown by my colleagues and myself, and I feel gratified that this work has been confirmed by our Norwegian colleague. It is difficult to interpret Prof. Poulsson's figures on the relative tests of Newfoundland and Norwegian cod-liver oils without a fuller description of the method employed by him. In our own work, with numerous samples of Newfoundland oils originating from different localities and from different seasons, the minimum growth-promoting dose as tested by the method of Zilva and Miura [1] was found to vary from 1·3 mg. to 1·6 mg. On the other hand, a much greater variation was found in the growth-promoting potency of the Norwegian Lofoten oils. Whether this variation was accidental or not, time will prove. At present neither the work of Prof. Poulsson nor of Prof. Drummond and myself can supply a definite answer.

It has now become necessary to reconsider the method previously employed for estimating the fat-soluble vitamins in the light of the new discoveries made in this field of research since the inception of the cod-liver oil inquiry. We are faced with the problem whether the high potency of individual cod-liver oils, as observed by employing "growth" criteria, should be referred to their content of vitamin A or of the antirachitic vitamin D or to the joint effect of both principles. If at the present time I desired a potent cod-liver oil, I should endeavour to procure a Newfoundland oil, not because it hails from a British possession, but because from the scientific information available it is of high and *uniform* potency as judged by the older methods employed for testing.

I am, Sir, yours faithfully,

S. S. ZILVA.

The Lister Institute of Preventive Medicine, London, S.W., Feb. 16th, 1926.

TRANSFUSION OF WHOLE BLOOD.

To the Editor of THE LANCET.

SIR,—Encouraged by Dr. Dyke's letter in your last issue reopening the subject of blood transfusion, I feel that several further points might well be raised. In the leading article in THE LANCET of Jan. 23rd it is stated that Dr. Platt finds that "reactions never occur" with defibrinated blood, and that "the minor reactions are all due to citrate." Neither of these statements is made in my paper (which appeared in that issue), as any careful reader may find out for himself. In my paper as drafted the question of the origin of the reactions was more fully dealt with, but this had to be cut down for publication.

With regard to Dr. Dyke's letter, the pathologists have repeatedly warned us of minor agglutinins, but, as pointed out in the same leading article, these have never seemed to be of much importance practically. No doubt a careful adherence to Dr. Dyke's technique of blood testing might eliminate some of the very infrequent and mild reactions which undoubtedly may occur with whole (uncitrated) or with defibrinated blood. (Incidentally, I do not like the term "whole" applied to citrated blood, which is, of course, deficient in available calcium.) However, as last week I had to test no less than 11 relations and friends of a patient before finding a Group IV. donor, I was glad to be content with a "two-minute" test.

I quite admit that I have omitted to take precautions against minor agglutinins, but Dr. Dyke, on the other hand, has disregarded entirely the scientific evidence that citrated blood may be toxic even to the individual from whom it was taken. References to this may also be found in my paper. If we agree that the problem of the cause or causes of reactions is still open to controversy, the only evidence acceptable must therefore be of a practical nature, and come from those who have had experience of the technique and results of both methods. I very much doubt if any one who has had that experience would ever go back to citration.

With reference to Dr. H. H. Moll's paper (in your issue of Jan. 23rd), though I am interested in his ingenious method, if he will try applying "a fair amount of pressure to maintain a steady flow of blood through the very fine needle" into a test-tube he will find that on centrifuging a good deal of hæmolysis has taken place. I have often wondered whether the injection of partially hæmolysed blood is not another possible cause of reactions.

I am, Sir, yours faithfully,

Sheffield, Feb. 20th, 1926. ROBERT PLATT.

*** We regret having attributed to Dr. Platt an opinion which he wishes to disown. The sentences in our leading article were intended to summarise his attitude, as the absence of quotation marks indicated. We seem, however, to have misinterpreted his intentions, and it will make the position clearer if we now reprint his actual words: "That the reactions are due to the citrate and not to the many other factors which have been suggested is shown by the fact that such reactions practically never occur when whole blood is used—and as I hope to show later, when defibrinated blood is used . . ." The difference between Dr. Platt's opinions and our restatement of them seems to be very small.—ED. L.

[1] Biochem. Jour., 1921, xv., 654.

CRIMINAL OFFENCES AND PROSTATIC ENLARGEMENT.

To the Editor of THE LANCET.

SIR,—I should be glad to correct two material errors in the last sentence of your otherwise accurate summary of my paper at the Medico-Legal Society on Feb. 16th; because I never suggested that in *most* cases the guilty person should be placed under the care of relatives, or that this was a function of the Procurator-Fiscal in Scotland.

My plea was that in certain cases only—namely, where the man had led an ordinary decent life up to the age of 60—the existence of prostatic enlargement in conjunction with symptoms might be advanced in mitigation of consequences; that in cases of indecent exposure the medical evidence, together with an undertaking by relatives that the guilty person would be placed under supervision and medical treatment, might lead the Procurator-Fiscal in Scotland to stop criminal proceedings; that the same evidence in England might lead magistrates to have the guilty person bound over; and that in all more serious cases medical treatment should be undertaken in prison, unless insanity was established within the limits of the McNaghten judgment.

It is certainly not the function of the Procurator-Fiscal to supervise the conduct of such persons, and except in the simplest cases, whose behaviour resembles senility more than vice, no relaxation of the criminal law was advocated.

I am, Sir, yours faithfully,

HALLIDAY SUTHERLAND.

Wimpole-street, W., Feb. 20th, 1926.

MEDINAL.

To the Editor of THE LANCET.

SIR,—The fatal case of poisoning by medinal so graphically described in your last issue attracted my attention, because this preparation of veronal has, for some years, been my favourite drug in troublesome insomnia. No estimate was apparently made of the amount of the fatal dose, but it was obviously enormous even for one who was the victim of a veronal habit. Dr. Stolkind's article conveys an ominous warning of the mental and physical degradation which awaits those who become addicted to di-ethyl-malonyl-urea, under any guise or nomenclature. But as long as hypnotics have a part to play in therapeutics, it seems to me very difficult to secure a drug which is safer than this one, which

I prefer to use in the form of medinal. The drug is certainly powerful as a hypnotic, but in my experience of it, it is innocuous to the digestive, circulatory, respiratory, and nervous systems if used in medicinal doses. The drug is obtainable in various forms, but I have come to rely on the medinal preparation because of its rapidity of action. It seems to me that the moral of this unfortunate case lies in its *social* aspect, and that the important therapeutic value of the drug is in no way compromised by the interesting report of Dr. Stolkind.

I am, Sir, yours faithfully,

J. SNOWMAN, M.D.

Brondesbury, N.W., Feb. 22nd, 1926.

*** We are glad to publish Dr. Snowman's letter. With reference to Dr. Stolkind's note which appeared in THE LANCET last week, it has been pointed out to us by Messrs. Schering, Ltd., that, while medinal, a scheduled poison, will, of course, be harmful if taken in grossly wrong doses, it possesses certain pharmacological characters contradicting the conclusions arrived at in the article. The opinion of Dr. Mackenzie Wallis, expressed during a discussion on insomnia at the Bath meeting of the British Medical Association, was to the effect that "sulphonal, veronal, and medinal in ordinary doses had no effect whatever on the functional activity of the liver and kidneys nor was there any effect on general metabolism . . . . all three drugs were rapidly excreted and showed no evidence of cumulative action." It is claimed for medinal that, being extremely soluble, it is rapidly absorbed and eliminated, cumulative effects being thereby obviated. —ED. L.

Obituary.

MEREDITH B. R. SWANN, M.D. CAMB.,

DEMONSTRATOR OF PATHOLOGY IN THE UNIVERSITY OF CAMBRIDGE.

WE alluded last week to the tragedy of Dr. Swann's early death. He performed a post-mortem on the morning of Feb. 6th on a patient suffering from lymphatic leukæmia, who had died with a high temperature probably due to a terminal infection. Swann sustained a small punctured wound through a rubber glove, the wound being at the tip of the middle finger of the left hand—it was thought to be due to a sharp tooth encountered whilst removing the larynx. No measures were taken until afterwards, when picric acid was applied, but about bedtime Swann himself made a small incision with a razor as the finger was painful, and at 4.30 A.M. on Feb. 7th surgical advice was taken. The temperature was then about 102°F. and the finger was at once laid open, the puncture excised, and antistreptococcus serum injected. Some slight axillary tenderness was noticed, and later in the day a large dose, 100 c.cm., of serum was given (pure streptococcus having been found in smears and early culture) and an extensive incision was made over a reddened site in the upper arm. The temperature on the 8th being about 100° and the axilla quiet, it was hoped that the mischievous process was under control; but on the 10th the temperature was higher and a wide clearance of inflamed glands was made from the axilla, at the apex of which a few drops of pus were discovered. This was the only pus seen in the illness, the subsequent history of which was chiefly one of incisions for spreading skin infection of the clinical nature of erysipelas. This occurred on the left side from the neck to the groin, and, although improvements at times followed, death from toxæmia took place on Feb. 16th.

Meredith Blake Robson Swann was born on July 29th, 1893. He was the son of Frederic Swann, at one time headmaster of Ilkley Grammar School and subsequently a member of the staff of the *Times*. Educated at Dulwich College, he was elected to a scholarship at Gonville and Caius College, and in 1914 was placed in the first class of the Natural Sciences Tripos. He completed the medical curriculum at King's College Hospital, and after acting as house physician and casualty officer was gazetted as surg.-lieutenant to H.M.S. *Bacchante*. He served in the Royal Navy until after the conclusion of the war, and in April, 1919, returned to England and was shortly afterwards appointed demonstrator of pathology in the University of Cambridge. In March, 1923, he was admitted to a Fellowship at Caius and in the same year he was awarded the Raymond Horton Smith prize, which is given for the best dissertation submitted for the degree of Doctor of Medicine.

Swann from the beginning showed that his return to a career of research was justified. He was greatly attracted by the work for which he had exceptional gifts. He was a brilliant and successful teacher, and both in the Department of Pathology and at Caius, where he became supervisor of medical studies, his exceptional ability was expended to its full extent for the benefit of his pupils. He was sincerely interested in teaching, and he never failed to interest the men whom he taught. In the selection and preparation of material for class-work he held no expenditure of time or pains too great to secure results which satisfied his judgment. He expected a high standard from the men whom he taught and he never spared himself in helping and encouraging others to do their work well. As supervisor of medical studies he exerted a great influence on the large number of students who came to him for guidance and advice. He took a prominent part in devising and carrying out the new courses in general pathology for Part II. of the Natural Science Tripos and was personally responsible for a well-planned schedule in experimental morbid histology.

Already his published work demands attention—it was concerned with the germination period of bacterial spores and with the effects of X rays on the functions of tissues and organs. More recently he had taken a very active interest in histology and was keenly studying methods for the production and demonstration of the minute anatomy of inflammation and necrosis.

Dr. Swann married in 1917 Marjorie, daughter of Mr. Alfred H. Dykes, of Beckenham, by whom he had three children, and the deepest sympathy for them in their loss is felt by all. His colleagues and his many friends were devoted to him and he was universally popular among his pupils; his death has caused a gap in university circles which will be hard to fill, and his memory will long abide at the centre of his work.

JAMES FAIRLIE GEMMILL, M.D., D.SC. GLASG., F.R.S.

BY the death of Dr. J. F. Gemmill, professor of natural history, University College, Dundee, the College has suffered a severe loss, as although he had only served it for six years his influence and teaching had already made themselves felt.

James Fairlie Gemmill had a brilliant record as student; in arts, in classics, and in philosophy he gained most of the prizes open to him, and in medicine his record was much the same. It was his ideal to take up scientific research. From the first he was attracted by marine biology, and after graduation his first few years were spent in equipping himself by study in the chief European marine laboratories. Returning to Glasgow University, he acted as assistant and later as lecturer-assistant in the anatomical department, and on the establishment of the new department of embryology was made lecturer in embryology with full charge of the laboratory. To a large extent, however, his bent was still towards marine biology. Largely through his efforts the West of Scotland Marine Biological Association was formed, and later the marine laboratory at Millport. In both these institutions he was the leading spirit. The material obtained from Millport gave him continuous problems for research and his steady flow of original articles showed that he utilised his opportunities to the full. His eager enthusiasm resulted in widespread interest in marine biology, and the summer courses in Millport attracted large classes. His promotion to

University College, Dundee, came in due course, and his influence there was soon felt. Again he had the congenial task of building up a local interest in natural history, and well he performed this task. He instituted popular science lectures in University College and his vast output of original work was recognised to be of high merit. His monograph on the Teratology of Fishes and his important researches on marine worms, the development of echinoderms, and the embryology of cœlenterates put him in the first rank of British zoologists. Gemmill's teaching was attractive and his influence lasting. In his relationship to his fellow men he was very fortunate in his happy gift of friendship. His wide knowledge, his kindly attitude, and his somewhat shy manner endeared him to all ranks and conditions of men. There was much sympathy when it was learned at the beginning of the winter session that he was obliged fo ask for leave of absence on account of ill-health. A prolonged holiday had helped but not cured him. He found it impossible to resume teaching, but was continuing with some of his research work at the time of his death. He was elected F.R.S. in 1924.

HUGH JONES ROBERTS, M.D. DURH., F.R.C.S. EDIN., D.L., J.P.

IN his sixty-fourth year Colonel H. J. Roberts, of Pen-y-Groes, near Carnarvon, has died at Southport, and by his death Carnarvonshire has lost one of its outstanding personalities. Hugh Roberts was the eldest son of the late Dr. Evan Roberts, whose practice he and his brother carried on at Pen-y-Groes. He qualified from Guy's Hospital, London, as M.R.C.S. and L.S.A. in 1885, and in 1907 took his M.D. degree at Durham. Four years later he became F.R.C.S. Edin. In his own county Dr. Roberts was a magistrate and deputy-lieutenant, and for a time acted as chairman of the Carnarvon bench. He was president of the North Wales branch of the British Medical Association, an hon. associate of the Order of St. John of Jerusalem in England, and a member of the Court of Governors of University College of North Wales. He was also a pioneer of the Volunteer movement, and for several years commanded the 6th Volunteer Battalion of the Royal Welch Fusiliers. During the war he had charge of military hospitals at Preston and Eaton Hall, and was afterwards medical commandant of the military hospital at Bangor until its disbandment. Colonel Roberts held the Volunteer long-service decoration and served in the Carnarvonshire Territorial Association. He leaves a widow, two sons, and two daughters.

HENRY RAYNER, M.D. ABERD.

Henry Rayner was born in East Kent in 1841. After completing his school education he entered as a student at St. Thomas's Hospital and qualified as M.R.C.S. Eng. and L.S.A. Lond. in 1864. From London he went to Aberdeen, where he graduated M.B., C.M., with high academic honours in 1866 and took his M.D. in 1870. Soon afterwards he was appointed resident assistant physician at Bethlem Royal Hospital, and a year or two later became medical superintendent (male division) of the Hanwell Asylum, from which he retired about 1891 for consulting practice. He was for a time lecturer on mental diseases at Middlesex Hospital, but subsequently returned to his own hospital (St. Thomas's), where he was appointed physician for mental diseases (out-patient department). This was the first appointment of its kind in connexion with a London general hospital. Early in his career Dr. Rayner took an active part in the Medico-Psychological Association and was its honorary secretary: in 1884 he was elected president, and at the time of his death, therefore, he was the second senior past president of the now Royal Medico-Psychological Association, Sir James Crichton-Browne being the senior. Dr. Rayner was one of the promoters of the After-Care Association for the Insane discharged from asylums on recovery, and some years back succeeded the late Sir George Savage as its chairman, retaining the post until his death. This Association will miss him greatly, for its work was always near his heart. He was a ready writer, and contributed articles to Allbutt's "System of Medicine" and to the medical journals. For some years he was one of the editors of the *Journal of Mental Science*. As he was in his eighty-fifth year at the time of his death he had survived most of his contemporaries, but to the few of his old friends who remained he was endeared by his courteous and cultured manners, intellectual energy, and sympathy for his fellow men. Until a few days before his death he was active in mind and body.

Dr. Rayner leaves a widow, two sons who are members of the profession, and one daughter.

MICHAEL FRANCIS COX, M.D. N.U.I.,

PAST PRESIDENT OF THE ROYAL COLLEGE OF PHYSICIANS OF IRELAND.

AT the age of 75, Dr. Michael Cox died on Feb. 20th at his house in Merrion-square, Dublin, after a long illness. He was educated at the Catholic University School of Medicine, Dublin, and qualified in 1875. Twenty years later he became Fellow of the Royal College of Physicians and in 1923 was elected President. Unfortunately, he fell ill shortly after election and only performed the duties of the office for a short time. In 1895 the honorary degree of M.D. was conferred on him by the Royal University of Ireland, and during the Viceroyalty of Lord Aberdeen he was made a member of the Irish Privy Council, an honour which he resigned in 1920 to mark his disapproval of the Irish policy of Mr. Lloyd George's Government.

After a short period of country practice in Sligo in his younger days, Dr. Cox moved to Dublin, and became a member of the staff of St. Vincent's Hospital, to which institution he gave devoted service for the rest of his life. He was a hard-working physician and a careful and clear teacher; in consequence he enjoyed a large private and consulting practice. Apart from his medical work he had many interests; he was on intimate terms with all the Irish Nationalist leaders, was an indefatigable reader and book collector, and was a vice-president of the Royal Society of Antiquarians of Ireland. His academic appointments included membership of the Senate of the Royal University, and subsequently of the National University, and he was also Chairman of Convocation of the latter.

In his time there were few physicians in Ireland who were better known or enjoyed a larger practice. A man of strong convictions and deep feeling, Dr. Cox was courteous and tolerant to all, and was recognised as a man of great kindness and generosity.

JOHN BENJAMIN STORY, M.B., M.CH. DUB.,

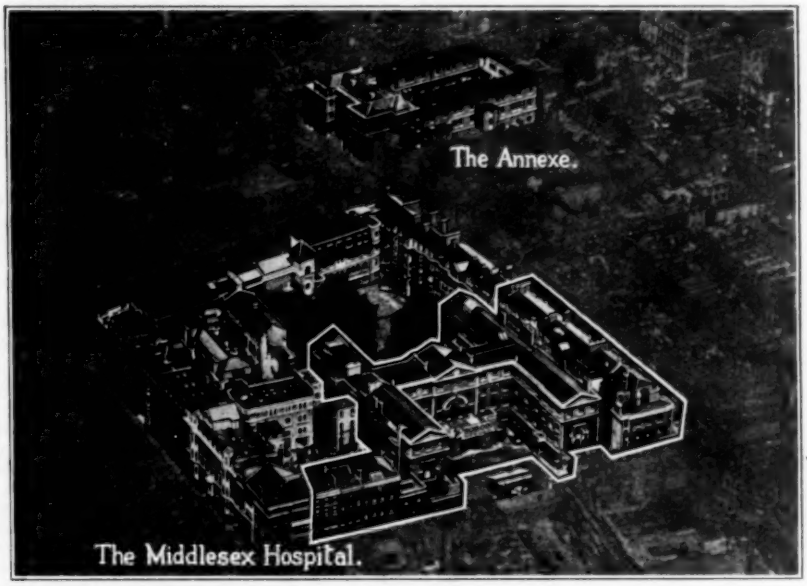
PAST PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS IN IRELAND.

THE death of Mr. John Story occurred on Feb. 19th at Malahide, Co. Dublin, after a brief illness. He had retired from practice a few years ago and had reached the age of 75. Mr. Story was educated in Trinity College, Dublin, where he took an honours degree in arts in 1872 and his medical degrees in 1876. He subsequently studied at Zürich and Vienna, and then took up ophthalmic practice in Dublin. He became a Fellow of the Royal College of Surgeons in Ireland in 1880, was for many years a member of the Council, and was President from 1918 to 1920. He was for some time surgeon to St. Mark's Ophthalmic Hospital, and when it merged into the Royal Victoria Eye and Ear Hospital in 1896 he became surgeon to that institution, in which he continued to work until his retirement from practice. Mr. Story was president of the Irish Medical Association in the year 1913–14. In addition to his work as surgeon at the Royal Victoria Hospital, he was ophthalmic surgeon to Dr. Steevens' Hospital, and consulting ophthalmologist to Mercer's Hospital. He had a large practice in his specialty, and both for ability and character held a high place in the profession in Ireland.

THE MIDDLESEX HOSPITAL ANNEXE.

FORMAL OPENING.

ON Feb. 23rd Mr. Neville Chamberlain, the Minister of Health, formally opened the temporary premises of the hospital in Cleveland-street. The building was once a Metropolitan Asylums Board infirmary and has been fully equipped from top to bottom according to modern standards of hospital design. There are six wards, two operating theatres, and an X ray department, and as the annexe is likely to be occupied for several years, during the reconstruction of the Middlesex Hospital, no pains have been spared to make it a self-contained unit of real efficiency. The transference of 98 patients over the distance of 250 yards from the condemned wards into the Cleveland-street annexe was successfully accomplished on Feb. 19th in less than three hours. The British Red Cross Society lent nine motor ambulances and the work was done by 36 students and the available staff of nurses. The aid of the police was needed to keep back the curious crowds that gathered in the neighbouring streets. The first patient was placed in an ambulance at 8.15 A.M. and the move was complete by 10.50—in ten minutes less than the time allowed. At the same time 14 patients were moved to another part of the main hospital.



View from the air showing the part of the Middlesex Hospital that is to be rebuilt (encircled by a white line) and the position of the Annexe.

Prince Arthur of Connaught, chairman of the hospital, formally welcomed Mr. Chamberlain, who, in a short address, touched lightly on many subjects of topical interest. He pointed out that the simplest, the easiest, and certainly the cheapest way of carrying on during the necessary reconstruction of the hospital would have been to refuse to accept any new patients until the numbers in the hospital had been so reduced that the old wards could be cleared for reconstruction. He had no doubt the Board must have considered such a course. But they regarded themselves as a unit in the great voluntary hospital system of London and they realised a responsibility towards the public. And so with great courage, but also with great wisdom, they took the opportunity to acquire an old building in close proximity to the hospital itself, and trusted to the public to see that the means were provided to carry out their plan. Moreover, they had not been content merely to provide a sort of clearing-house for their patients, but had visualised the ultimate conversion of the annexe into a new out-patient department which should be worthy of their importance in the hospital world. An out-patient department might not always seem as interesting or as important as an in-patient department, but it stood to the institutional work of the hospital in somewhat the same relation as prevention does to cure. It was in the out-patient department that the surgeon or the physician saw the first premonitory symptoms of disease, and it was there that often he was able to take such measures as might make it unnecessary for the patient even to visit the wards of the hospital.

The recent history of this hospital was a rather striking testimony to the vitality of that long threatened, but apparently unconquerable voluntary system. The three great functions of any general hospital were the provision of treatment for accident and for disease, the training of future practitioners, and the pursuit of research. It was a significant fact that every teaching hospital in this country was on the voluntary principle and that the voluntary hospitals were not only the pioneers of medical research, but are still actively developing the research side of their activities. The voluntary system had admitted defects and gaps and it was not altogether unnatural that some people should protest against the uncertainties of a scheme which depended entirely upon the voluntary offerings of a generous public, and plead that it should be turned over to the State, and to the boundlessness and unfailing resources of the Chancellor of the Exchequer. Were we certain, however, that they are unfailing? It would not be very long before we were all made aware of the state of the national purse, and then we should know whether we could afford to despise these voluntary sacrifices, which, to the givers, formed a source of satisfaction, in that they were giving of their own free-will what they would only yield to compulsion with reluctance and perhaps even with resentment.

In Mr. Chamberlain's opinion, destruction of the voluntary system would be a national disaster of the first magnitude. It might be that some day the health services would be so developed as to come nearer to the ideal plan under which there should be no unnecessary duplication, no waste, no overlapping, and yet which should offer to every citizen not merely the highest professional skill, but the use of all that wonderful apparatus and equipment which modern science had put at our disposal. Even to get an approximation to such an ideal meant that every agency now working for the prevention or the cure of disease would have to be coördinated. It might be that, if an adequate place was to be found in such a scheme for voluntary hospitals, it would be necessary to bring about some changes in their relations with other institutions, to ask them to yield up something of the complete independence they enjoyed to-day. But if such a change should ever come about he expressed conviction that the change must be so contrived that they should not in any way impair or injure those great qualities which had made our voluntary hospitals the pride of this country.

INTRATHORACIC NEW GROWTHS.

A MANY-SIDED DISCUSSION.

AT a combined meeting of several Sections of the Royal Society of Medicine — Medicine, Electro-Therapeutics, Surgery, and Laryngology—held on Feb. 23rd, the chair being occupied by Dr. Hugh Thursfield, the President of the first-named Section, a discussion on Intrathoracic New Growths was introduced, from the medical aspect, by Dr. L. S. T. Burrell, whose paper appears in full on p. 435.

The Laryngological Aspect.

Mr. Somerville Hastings, speaking as a laryngologist, said that intrathoracic new growths made themselves known (1) by laryngeal symptoms due to pressure on the vagus and its branches, (2) by pressure on or involvement of the œsophagus, (3) by obstructing the lumen of the trachea or bronchi. Involvement of the pneumogastric nerve might cause paroxysms of coughing. The exact results laid down in Semon's law occurred, the abductor fibres going first and being followed by the adductor. When both recurrent nerves were involved, or one or both was in the first stage of pressure, there might be considerable dyspnœa and noisy inspiration. When an intrathoracic tumour was malignant and when complete paralysis of both cords was certain, should the patient live long enough, he considered that intubation was preferable to tracheotomy, for it would tide the patient over until the stage was reached of complete cord paralysis in the cadaveric position. A mediastinal tumour might first become evident by pressing on the œsophagus and causing difficulty in swallowing. In most cases of œsophageal obstruction more accurate information was obtainable by passing the œsophagoscope than by taking skiagrams after an opaque meal; especially was this so when a mediastinal tumour was present. To relieve the obstruction the passage of a Symonds's or a Souttar's tube might be necessary, or well-screened radium could be applied to the growth from the œsophagus. Rarely was gastrostomy required. Examination of the main bronchi could well be carried out by means of the bronchoscope, while with the use of that instrument bismuth subcarbonate or lipiodol could be carried out, and the condition rendered clear to the X rays. As a result of obstruction of bronchi by new growth bronchiectatic dilatations often occurred, and lung abscesses, with foul breath, might follow. In such a condition the comfort of the patient, and therefore of his friends also, was much increased by performing lavage through the bronchoscope.

The Surgical Aspect.

Mr. J. E. H. Roberts gave his extensive experience of dealing surgically with the kind of growths under discussion. He reminded the meeting of the saying of Dr. Finney, of Baltimore, that in regard to intestinal obstruction it was more important to operate early than to operate well. There was not the same urgency about intrathoracic tumours, but until diagnosis was made earlier treatment for malignant tumours would be merely palliative, and even in innocent tumour cases the treatment would continue to be more difficult and risky than it need be. The clinician still regarded chest tumours as rare events, hence when they occurred they were often unsuspected; but it was hoped that a result of this discussion would be that physicians would be on the look-out for the early signs and symptoms of carcinoma of the bronchi and of the lung, and diagnosis by various methods arrived at, such as by X ray examination with various aids, bronchoscopy, thoracoscopy, blood examinations, complement-fixation, &c. He confined his remarks to neoplasms. Innocent neoplasms were rarer than malignant ones, but now that the chest was being so frequently X rayed these were being found in larger numbers. The commonest innocent tumours in this region were dermoid cysts and fibromata, the dermoid cysts being generally in the anterior mediastinum. As a general principle Mr. Roberts said that if an innocent tumour in the chest was discovered before any symptoms arose from it it should be removed at that stage, as operative risks were then at a minimum. The two main modes of access to these growths were: (1) transpleurally, by a long intercostal incision; (2) by a sternum-splitting operation. A smoother convalescence followed the second method in tumours which filled the apex of the chest, and the first method for those of the middle and lower parts of the chest.

Concerning the primary sarcomata of the lung or mediastinum, these were best treated by X rays or by the implantation of radium. Final cure was not to be expected. Primary carcinoma of the lung seemed to have become more frequent in the last ten years, and it was met with in two main forms: (1) the commoner one commencing in the bronchus; (2) the rarer, starting in the parenchyma. In either case there was constriction of the lumen of a bronchus followed, at first with the absorption of the air beyond, retention of secretions, later on by bronchiectasis, lung abscess, and empyema. If such a patient were seen before infection it should be possible, from the altered breath sounds and percussion note, to suspect bronchial blockage and to discover its cause by bronchoscopy. Experimental work had shown that resection of uninfected lobes of lung could be carried out without great mortality, but when gross infection was added the mortality of that operation was very high. Parenchymatous growths were more amenable to surgery. The palliative treatment of carcinoma of the lung consisted in drainage of pulmonary abscesses and of secondary empyemata, bronchostomy to drain dilated bronchi, &c. The comfort to the patient rendered these procedures well worth while.

The Radiological Aspect.

Dr. Stanley Melville gave an historical sketch of the progress of skiagraphy, and described the general contours and appearances of thoracic growths as he had met with them. Most of his contribution consisted of a demonstration of differential features as seen in the X ray plates, and the best methods of bringing out the diagnostic features.

Dr. Robert Knox also demonstrated a series of skiagrams with the same object, his chief purpose being to insist on the supreme importance of making a diagnosis before any attempt was made at treatment. He said that during the last year he had had six cases of aneurysm of the aorta sent to him for treatment under the impression that they were examples of malignant neoplasm; possibly on occasion he had treated with rays an aneurysm as a neoplasm. He showed skiagrams at different stages illustrating the value of X rays in causing the disappearance of such tumours as lymphosarcoma, and insisted that there was no need to carry out surgery in such cases in order to insert radium, as the curative effect of the rays was very remarkable. In some long-standing cases it was evident that the natural resistances of the body had become exhausted and no effort could be put forward by the patient to respond to the treatment.

Discussion.

Dr. Hilton urged the induction of an artificial pneumothorax in order to facilitate not only the clarity of X ray pictures, but also surgery should that be necessary, as surgeons had remarked on the greater ease of operation on a collapsed lung. The air in the lung need only be slightly different from the normal, either at or just below the atmospheric pressure.

Sir John Briscoe demonstrated by means of the epidiascope the signs by which paralysis of one phrenic nerve could be definitely diagnosed. He said that in the last three years he had correctly diagnosed the condition in 41 cases. Of these cases 22 were primary growths in the thorax, 10 secondary, 6 due to syphilis (including aneurysm), and 3 to tubercle. The phrenic nerve on the right side was involved in 31 instances, on the left in 13, on both in 3. He insisted on the importance of examining these patients in a very quiet condition, and refraining from asking them to take a deep breath.

Dr. F. G. Chandler spoke on differential diagnosis and treatment. He urged early diagnosis of intra-

thoracic tumours, as it was only at that stage that hopeful surgery could be expected.

Dr. Devereux Forrest gave a detailed and analytical account of an investigation he had conducted in 152 post-mortem examinations in cases of carcinoma of the lung at the London Hospital from 1907 to 1925. All the cases were certified by Prof. Turnbull at the hospital as carcinoma. He had been unable to associate any particular occupation with the occurrence of these growths, the only notable point in this regard being that no agricultural labourer was in the list.

The President (Dr. Thursfield) combated the idea expressed by several speakers that these intrathoracic new growths were becoming more common. This appeared to have been founded on the increased number of such cases seen at the hospitals, but it must be remembered that the total admissions to London hospitals was nearly double in 1925 that of 1907, and patients passed through the hospitals more rapidly. Also considerable classes of cases had been removed from the wards of general hospitals, particularly tuberculous cases. Desperate carcinomata and other cases of the kind were now freely admitted, whereas within his own memory that was not the case. He did not believe the apparent increase in the kind of cases under discussion was a real one.

Mr. T. P. Dunhill submitted that the diagnosis of intrathoracic new growths from other conditions, even by the use of all the means now available, was often a very difficult matter. He showed skiagrams of three particular cases and pointed the lessons.

Dr. Willis said it seemed to be clear that, if looked for, these new growths in the thorax were not much less common than were malignant growths in other organs. He devoted special attention to the clinical aspect, as that was the one in which the disease first presented itself, and a study of the cases at this stage would result in their being recognised at the period when they could hopefully be operated upon. The symptoms fell into three groups according to the situation of the tumour, and these he fully entered into, describing cases in illustration.

The President, summing up the discussion, expressed his surprise that more had not been said about the early occurrence of dyspnœa in these cases. Often patients did not volunteer a complaint of dyspnœa, but a leading question mostly elicited it, and even when so gleaned he regarded it as a sign of more value than seemed to have been accorded to it by most of those who had spoken. A second point was that stressed by Sir John Briscoe—namely, the importance of the physician actually seeing the screening of the case; he should not be merely content with seeing the X ray plate, especially as in that case he was dependent on the radiographer's interpretation of it. This was of special importance when the case was one possessing a large element of doubt, for by means of the fluorescent screen various positions could be taken up and the whole case viewed critically.

Mr. Roberts, in reply, agreed with Dr. Hilton as to the advantage to the surgeon of the induction of a preliminary artificial pneumothorax, as well as its value in diagnosis. He had seen large external veins on the chest in innocent tumour cases, but not very large veins. He agreed that every diagnostic aid should be utilised in the case of these difficult tumours. If in the case of innocent tumours X ray pictures were taken at intervals to learn whether increase in growth had occurred, the same distance and other details should be observed every time. Otherwise a false impression might be derived.

Dr. Melville, in reply to Dr. Forrest, said he thought all clinicians were now agreed that one of the striking and constant features of intrathoracic new growths was displacement of the heart to the side of the lesion. With regard to the President's remark concerning the screen examination by the physician himself, radiologists as a body would welcome this intrusion into what was still too much the water-tight compartment of their specialty. Everything should be done to bring the physician and the radiologist into closer working relationship.

Medical News.

UNIVERSITY OF OXFORD.—At a recent Congregation the degrees of B.M., B.Ch. were conferred on R. G. Mathews (Queen's College) and D. O. Williams (Jesus College).

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates passed in the subjects indicated:—

Surgery.—J. Dywien, Guy's Hosp.; M. Escovar, Cambridge and London Hosp.; A. C. Hill, Liverpool; J. E. Howard, St. Mary's Hosp.; J. Mindess, London Hosp.; L. A. Rostant, St. Thomas's Hosp.; J. Shibko, Cardiff; and V. R. Smith, Manchester.

Medicine.—G. H. Bickmore, Charing Cross Hosp.; T. K. Clifford, Manchester; E. W. Hayward, Cambridge and London Hosp.; W. Johnson, St. Mary's Hosp.; J. M. Moran, Manchester; C. E. Nicholas, London Hosp.; I. Rivlin and G. H. Weeber, Middlesex Hosp.; and J. M. F. Whitby, St. Thomas's Hosp.

Forensic Medicine.—C. B. Ball, Sheffield; T. K. Clifford, Manchester; E. W. Hayward, Cambridge and London Hosp.; C. H. St Johnston, Birmingham; G. H. Pereira, St. George's Hosp.; J. Shibko, Cardiff; and J. W. Whitney, London Hosp.

Midwifery.—N. H. C. Allen, Guy's Hosp.; F. W. Barton, Middlesex Hosp.; V. G. Crowley, Sydney and St. George's Hosp.; M. Escovar, Cambridge and London Hosp.; H. I. Jones, St. Mary's Hosp.; D. P. Mitra, Charing Cross Hosp.; and G. H. Pereira, St. George's Hosp.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: T. K. Clifford, V. G. Crowley, E. W. Hayward, J. Mindess, G. H. Pereira, and L. A. Rostant.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—In the recent sessional examination of the division of tropical medicine and hygiene the winner of the Duncan Medal was Mr. R. M. Morris, late house physician at the London Hospital.

UNIVERSITY OF BRISTOL.—At examinations held recently, the following candidates were successful:—

EXAMINATION FOR DEGREE OF CH.M. (IN GYNÆCOLOGY).
Harry L. Shepherd.

FINAL EXAMINATION FOR DEGREES OF M.B., CH.B.

Part I.—John C. Batt, Winifred P. Brinckman, Alan M. Critchley, *Thomas F. Hewer, Reginald Jackson, John E. Martin, John R. E. Sansom, Maiprom Srisvasti, *Dorothy M. H. Tripp, and Edgar R. Wide.

* Distinction in Materia Medica, Pharmacy, Pharmacology and Therapeutics.

Part II.—Second-class Honours.—Charles B. Perry (distinction in Obstetrics).

Pass.—Geoffrey W. R. Bishop, Robert V. Cooke, Francis S. Dymond, Francis R. Gedye (distinction in Pathology and Forensic Medicine and Toxicology), Arthur P. Corham, Thomas P. Lalonde, Gilbert M. Minific, Leslie B. Phillips, and Arthur S. Prowse.

Group II only.—George L. Feneley and Cecily France-Hayhurst.

The degree of M.D. has been conferred on Elizabeth Casson.

IDEAL HOME EXHIBITION.—The tenth *Daily Mail* Ideal Home Exhibition will be held at Olympia, London, from March 2nd to 27th. There will be sections devoted to the lighting, heating, and ventilation of houses.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On March 4th, at 5 P.M., a lecture on Dyspepsia will be given by Dr. E. P. Poulton in the lecture room of the Medical Society, at 11, Chandos-street, London, W. This lecture is free to all members of the medical profession. Beginning on March 1st, there will be a special series of demonstrations on the Diagnosis and Treatment of Diseases of the Eye at the Royal Eye Hospital, St. George's Circus, Southwark. These demonstrations will be given by members of the staff and will take place at 3 P.M. daily for a fortnight. On Tuesdays and Thursdays throughout the month there will be a special course in bacteriology at the Westminster Hospital, and a two-hour session will be held on each of these days. On March 8th, and for the next three weeks, the Chelsea Hospital for Women will hold a special course in gynæcology. Operations, demonstrations, and lectures will take place daily. From March 15th to 27th the Brompton Hospital will hold an all-day course in Diseases of the Chest, and on the 16th the London School of Tropical Medicine will begin a series of eight clinical demonstrations, extending over four consecutive weeks, on Tuesdays and Thursdays at 2 P.M. For the benefit of those who are unable to devote the whole day to study, the Hampstead General Hospital is holding a special post-graduate course for practitioners from March 15th to 26th. The daily sessions will be held from 4.30 to 6 P.M., and will include clinical and surgical demonstrations and lectures. Copies of all syllabuses, of the general course programme, and of the *Post-Graduate Medical Journal* may be had on application to the Secretary of the Fellowship at 1, Wimpole-street London, W. 1.

UNIVERSITY OF LONDON.—Applications for grants from the Thomas Smythe Hughes Medical Research Fund, which are allocated annually for the purpose of assisting original medical research, should be sent in not earlier than May 1st and not later than June 15th. Particulars may be obtained from the Academic Registrar.—A studentship in physiology, of the value of £50 for one year and tenable in a laboratory or school of the University, will be awarded to a student or graduate annually. Applications must be received by the Principal Officer on or before May 31st.

INTERNATIONAL PHYSIOLOGICAL CONGRESS.—The twelfth congress is to be held at Stockholm from August 3rd to 6th. Those who wish to be enrolled as members should forward their names and addresses, together with the amount of their subscription (20 Swedish crowns), to Dr. G. Liljestrand, Karolinska Institutet, Stockholm. Further particulars will be given later.

PEOPLE'S LEAGUE OF HEALTH.—The League has arranged a series of six lectures on Diet: What We Should Eat and Why, to be delivered in the lecture-room of the Medical Society of London, 11, Chandos-street, Cavendish-square, London, beginning on Wednesday, March 10th, at 6 P.M. The following is a list of lecturers and subjects: Dr. Leonard Hill, F.R.S., The Nature and Purpose of Food; Prof. R. H. A. Plimmer, Vitamins; Dr. M. J. Rowlands, Diet in Relation to Tuberculosis and Rheumatism; Dr. W. Cullis, Food in Relation to Growth; Prof. V. H. Mottram, Common Errors in Diet; Prof. W. E. Dixon, F.R.S., Food Preservation and Adulteration.

Lectures in Prisons and Borstal Institutions.—The second series of the Sims Woodhead Elementary Course of Constructional Health Lectures has just been concluded by the People's League of Health at Wandsworth Prison and Borstal Institution, Rochester. The course was followed by a written examination, and certificates and prizes will be awarded to those who have gained the highest number of marks. This course has also been given at the Borstal institutions at Feltham and Aylesbury.

LEAGUE OF NATIONS AND MALARIA.—The health organisation of the League has arranged to hold next summer in London, Paris, and Hamburg, special laboratory courses on malaria. These will be reserved for medical officers. During its tours of Eastern and Southern Europe, the League's Malaria Commission was impressed by the fact that a number of countries were prevented from carrying on systematic antimalarial campaigns owing to the shortage of specially trained physicians. The health organisation, therefore, has decided to organise courses in malariology for young physicians desiring to specialise in this subject in order to become members of their public health administrations. The health committee has secured the collaboration of Dr. Andrew Balfour, director of the London School of Hygiene and Tropical Medicine, who will hold a theoretical and laboratory course in London, details of which may be obtained from the health section of the secretariat of the League of Nations at Geneva. Field work, lasting several months, in such malaria-infected countries as Corsica, Italy, Spain, Jugo-Slavia, and possibly Palestine, will follow the theoretical stage of the course.

INTERNATIONAL SOCIETY OF SURGERY. — As announced in our issue of Feb. 13th, the seventh congress will be held in Rome from April 7th to 10th. Prof. Giordano, of Venice, will be the President, and the subjects for discussion are: (1) Radium Treatment of Uterine Cancer. Speakers: Dr. O. Beuttner (Geneva), Dr. M. Donaldson and Dr. S. Forsdike (London), Dr. E. Pestolozza (Rome), Dr. G. Recasens (Madrid), and Dr. Regaud (Paris). (2) Abscess of the Liver: Dr. J. Domenici (Rome) and Dr. Petridis (Alexandria). (3) Treatment of Cerebral Tumours: Dr. A. W. Adson (Mayo Clinic), Dr. Bastianelli (Rome), Dr. de Martel (Paris), Mr. Percy Sargent (London), Dr. Brun (Lucerne), and Dr. M. Lozano (Saragossa). (4) Surgery of the Spleen: Dr. Cortes-Llado (Seville), Dr. Henschen (St. Gall), Dr. Leotta (Bari), Dr. Papayoannou (Ghezireh), and Dr. Patel (Lyons). (5) Late Results of Jacksonian Epilepsy: Dr. Leriche (Strasburg). Operations will be performed in the hospitals on two mornings. Two tours have been arranged in connexion with the congress: (1) A tour to Milan, Venice, Padua, Bologna, and Florence, starting from London on March 29th and arriving in Rome for the commencement of the congress. (2) A tour to Naples, Pompeii, Vesuvius, and the Isle of Capri, from April 13th to 16th. Messrs. Thos. Cook and Son, Ltd., have been appointed official agents and will quote inclusive fares based on the reductions granted by the Italian State railways to members of the congress, who may be accompanied by their wives and families. Further particulars may be obtained from the British delegate, Mr. J. E. H. Roberts, 26, Harley-street, London, W. 1.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—The Morison lectures will be delivered on March 1st, 3rd, and 5th, by Dr. R. D. Clarkson, in the hall of the College, at 5 P.M. The subjects of the three lectures will be the Definition of Mental Deficiency and the Classification of Mental Defectives; the Causes of Mental Deficiency; and the Treatment of Mental Defectives.

HEALTH LECTURES AT WILLESDEN.—Under the auspices of the Willesden Urban District Council a series of lectures on health will be given during March. The first, entitled the Foundations of Public Health, will be given at Pound-lane Council School, Willesden, N.W., on Thursday, March 4th, at 8 P.M., by Sir George Newman. On the three following Thursdays, at the same hour, there will be lectures by Dr. C. S. Thomson, Dr. H. B. Brackenbury, and Dr. C. W. Saleeby.

INSTITUTE OF HYGIENE.—A series of lectures on the Health of the Child of School Age is being given at 28, Portland-place, London, W., on Wednesdays, at 3.30 P.M. All interested in health problems may attend. On March 3rd Dr. Soltau Fenwick will speak on Disorders of the Digestive Organs during School Life; on March 10th Dr. C. E. Shelley will speak on the Incidence of Infectious Diseases in Public Schools; on March 17th Dr. R. Scott Stevenson will deal with Affections of the Ear, Nose, and Throat and their Prevention; and on March 24th Lieut.-Colonel R. H. Elliot will discuss Eye Troubles of School Life.

A STUDENTS' BED AT BIRMINGHAM.—The fourth bed endowed at the Queen's Hospital by the Birmingham University students has been dedicated by the Lord Mayor. The cost, £1250, was allocated from the proceeds of the students' carnival held last October, together with a further sum of £600 given to the general funds. These carnivals have been the means of contributing a total of £6800 to the hospital.

ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.—At a recent meeting at which the President, Prof. Archibald Young, took the chair, Mr. George Dalziel showed three cases of trigeminal neuralgia which had responded satisfactorily to injections of alcohol into the third branch of the fifth nerve. Mr. James Learmonth read a paper on Neuralgias of the Head and their Treatment, in which he recommended earlier resort to operation in trigeminal neuralgia. The best procedure was division of the sensory root of the fifth nerve between the ganglion and the pons, which gave instant and permanent relief at the cost of permanent anæsthesia over the distribution of the nerve. The technique he employed was that of Dr. A. W. Adson, neurological surgeon to the Mayo Clinic.

ORTHOPÆDIC HOSPITAL OF IRELAND.—The Incorporated Orthopædic Hospital of Ireland has now entered its jubilee year. The hospital was founded in 1876, mainly by the efforts of the late Mr. R. L. Swan. At first it consisted of six beds in Mr. Swan's own house at Usher's Island, Dublin. Seven years later it moved to Great Brunswick-street, where 48 beds were available. In 1902 it moved to its present site in Upper Merrion-street, and it has now 80 beds. During the 50 years of the life of the hospital some 30,000 children have been treated. Last year no less than 1576 children were treated. From the foundation of the hospital up to his death in 1916 Mr. Swan was surgeon to the hospital, and was its guiding and active spirit. To his surgery and foresight the crippled children of Ireland owe much.

LONDON CLINICAL SOCIETY.—The inaugural meeting of this society was held at the London Temperance Hospital, Hampstead-road, on Feb. 18th, Mr. H. J. Paterson, the president, in the chair. In his opening remarks the President said that the object of the society was to interest practitioners of the neighbourhood in the work of the Temperance Hospital, by offering them the opportunity of discussing cases of clinical interest in its wards. The chief guests of the evening were Sir StClair Thomson, who wished the society every success, and Sir Arbuthnot Lane, who gave an interesting discourse on the question: Is Civilisation a Failure? The answer, he considered, was in the affirmative. Savage races which had lived in happiness and health for hundreds of centuries degenerated and decayed as soon as civilisation touched them. The failure of civilisation lay in an alteration of the simple mechanical relationship Nature intended us to maintain towards our surroundings. This has caused alterations in human anatomy which had produced all the ills from which we suffered to-day. The lecture was illustrated by lantern slides. The first clinical evening of the society will be held on March 18th, when cases and specimens will be shown. Particulars of membership may be obtained from the Secretary, Dr. Philip Figdor, 150, Harley-street, W. 1.

OVERSEAS MEDICAL OFFICERS.—The annual reunion dinner of the Overseas Medical Officers will be held at the Exchange Hotel, Liverpool, on Thursday, March 4th, at 7.30 P.M. Tickets, price 12*s.* 6*d.*, may be obtained from Dr. J. W. Burns, 49, Rodney-street, Liverpool.

ABERDEEN ROYAL INFIRMARY.—For the first time for at least half a century this hospital has paid its way, and has, moreover, added £15,000 to its capital, notwithstanding that last year it treated a larger number of patients than ever before. Very soon, however, extensive additions will have to be made to the buildings. Workmen's contributions have now reached nearly £4000, and patients' contributions amounted to £2000.

COST OF THE SMOKE EVIL.—At a meeting of the Circle of Scientific, Technical, and Trade Journalists held in London on Feb. 16th, Dr. John S. Owens, of the Meteorological Office, said that the cost arising either directly or indirectly from smoke approximated in the case of London to 24*s.* per head per annum, in Manchester to 30*s.* per head, and in Pittsburg to 87*s.* per head. In London the cost was £7,000,000 a year, all of which could be saved if smoke was done away with. The cost to the whole country was colossal. All this was preventable, and the engineer was quite capable of dealing with the problems if only there was a strong public demand for a solution.

A MOSQUITO BITE CLAIM UNDER COMPENSATION ACT.—An unusual compensation action was heard recently at the Manchester County Court before Judge T. B. Leigh. The applicant was Mrs. Nora Robinson, of Ancoats, Manchester, a widow, who applied under the Workmen's Compensation Act in respect of the death of her husband, who had been employed as a donkeyman on board the ship *Tringa*, owned by the respondents, the British and Continental Steamship Company, Limited, of Liverpool. The fact that Robinson was bitten by a mosquito when the vessel was at Ghent on August 5th and died 13 days thereafter, when the vessel arrived in the Manchester Ship Canal, from septicæmia and pyæmia following cellulitis, was not disputed. The judge said that the *Tringa* at Ghent was unloading 300 or 400 yards from marshy land, which was the breeding-ground for mosquitoes. The lights of the ship were brighter than those on shore, and he was satisfied there was a greater danger of being bitten on board than there was in the town, where certain preventive precautions were taken. Robinson had to attend to two furnaces and was bound to have an unshaded electric light in order to do his work properly. The heat and light of the boiler house attracted mosquitoes, while Robinson had a smaller chance of avoiding their attacks than he would have had if he had not been at work. The judge held that the mosquito bite was an accident within the meaning of the Compensation Act and gave his award in favour of the applicant in the agreed sum of £334 with costs. Counsel for the respondents said he would like time to consider the position, and at his request a stay of execution was granted upon payment of the money into court within seven days.

CLINICS FOR RHEUMATIC PATIENTS.—At a conference of delegates of the Provincial Centre of the National Association of Trade Union Approved Societies held in Manchester on Feb. 16th, Mr. W. A. Appleton, secretary of the General Federation of Trade Unions, gave an address on the Incidence and Cost of Rheumatism. He said that an analysis of the medical certificates received at the office of the General Federation of Trade Unions showed that from 6 to 10 per cent. of the invalidity arose from rheumatic causes, and that 370,000 insured persons each year sought advice for some form of rheumatic disease or consequence thereof. Spas were available for the treatment of the rich. What was good for them might be equally good for the poor, but the existing capacity of the spas, allowing for an average 21 days per case for treatment, was not more than 12,000 persons per year. Clinics were needed for the benefit of those not likely to benefit by spa treatment—for experiment, for advice, and for the encouragement of those who might be treated in their own homes or by themselves. The cost of installation and maintenance of such clinics would be considerable. The Ministry of Health might agree to contributions on a pro-rata basis for the creation of several experimental clinics. A better, because a freer, way would be to secure several clinics by voluntary effort, and it ought not to be impossible to persuade every one of the million members of the Trade Union Federation of Approved Societies to raise sixpence to provide and equip a clinic in London and one in Manchester. Mr. Appleton suggested that the Federation should coöperate in the effort and in ascertaining from the Ministry of Health how far it would encourage collaboration for experimental purposes. One-seventh of the total sickness benefit, or nearly £2,000,000 a year, was paid to the insured population for invalidity from this disease.

Parliamentary Intelligence.

HOUSE OF COMMONS.

WEDNESDAY, FEB. 17TH.

Tuberculosis in the Navy.

Captain FAIRFAX asked the First Lord of the Admiralty whether the latest figures available showed any decrease of tuberculosis in the Navy; and whether he was satisfied that all reasonable precautions were enforced to prevent the spread of this disease.—Mr. DAVIDSON (Parliamentary Secretary to the Admiralty) replied: The ratio per 1000 invalided during the last four years was: 1922, 1·96; 1923, 1·61; 1924, 1·57; and 1925, 2·29. The answer to the second part of the question is in the affirmative.

Families Living in One and Two Rooms.

Mr. THURTLE asked the Minister of Health if he had any figures in his department showing the number of persons living in England and Wales in homes of one room; and the number living in homes of two rooms.—Sir. K. WOOD replied: According to the Census of 1921 there were in England and Wales 317,417 private families consisting of 623,869 persons occupying one room per family, and 917,958 private families, consisting of 2,834,802 persons, occupying two rooms per family.

Maternal Mortality.

Mr. GROVES asked the Minister of Health the number of mothers who lost their lives from causes due to childbearing in England and Wales during 1923 and 1924; and the ratio of such deaths to the total births during the year.—Sir K. WOOD (Parliamentary Secretary to the Ministry of Health) replied: The following statement gives the number of deaths from these causes in 1923 and 1924 and the mortality rates per 1000 births registered:—

—	1923.		1924	
	No.	Rate.*	No.	Rate.*
Deaths of women classed to pregnancy and childbearing	2892	3·81	2847	3·90
Deaths of women not classed to pregnancy and childbearing, but returned as associated therewith ..	764	1·01	851	1·17
Total	3656	4·82	3698	5·07

* Mortality rate per 1000 births registered.

The number of births in England and Wales was 758,131 in 1923, and 729,923 in 1924.

Mr. GROVES asked the Minister of Health what improvement, if any, was manifest respecting the maternal mortality in rural, textile, and coal-mining areas; and whether it was the custom for all medical officers of health to investigate all maternal deaths due to childbirth, and all cases of puerperal fever whether fatal or not.—Sir K. WOOD replied: On present information my right hon. friend is unable to say that there has as yet been any general improvement in the maternal mortality rate in these areas, but the figures for 1925 are not yet available. As regards the second part of the question, the Circular issued by my right hon. friend's department in June, 1924, on the subject of maternal mortality impressed upon local authorities conducting maternity and child welfare schemes the desirability of competent medical investigation into all the maternal deaths and all cases of puerperal fever. The extent to which this practice is adopted varies in different areas.

Medical Examination at Labour Exchange.

Mr. NEIL MACLEAN asked the Minister of Labour whether he was aware that a number of women who were signing at the Govan labour exchange had been called upon to undergo a medical examination by medical doctors at the exchange; whether he could state the reasons for this course and its purpose; whether the medical examination was compulsory on those called to undergo it; if not, whether women so called upon could refuse without prejudice to their claims for benefit; and under which statute these powers were operated by his department.—Sir A. STEEL-MAITLAND replied: I presume the hon. Member refers to a test which is being carried out with my consent by the Industrial Research Fatigue Board. Acceptance of the test, which is carried out by a woman doctor and a woman assistant, is absolutely voluntary and does not affect benefit in any way. The proposal of the Board was considered by a conference of women representatives of local employment committees in Glasgow who considered that it would be useful.

Mr. MACLEAN: Are we to take it that women who are going to the exchanges are told that they are to be examined by a lady doctor without it being explained that it is voluntary, and are they led to assume that if they do not undergo this medical examination their claim to benefit will be prejudiced and probably disallowed; and further, will the right hon. gentleman have this practice discontinued?

Sir A. STEEL-MAITLAND: The hon. Member must not draw the inference that women are led to undergo any examination without being told that it is voluntary on their part. I will undertake to see that it shall be made quite clear that the examination is entirely voluntary and unconnected with benefit. On the other hand, inquiries by the Research Board are for the general good, and I should be very sorry to stop them.

THURSDAY, FEB. 18TH.

Diseases Scheduled for Workmen's Compensation.

Mr. JENKINS asked the Home Secretary the description of diseases under the Workmen's Compensation Acts Orders which had been scheduled by his department up to date.—Sir W. JOYNSON-HICKS replied: An up-to-date list of the scheduled diseases with their full descriptions will be found in Appendix II. of the Home Office Memorandum on the Acts which is printed and on sale. Over 30 diseases have been scheduled. In addition to the diseases scheduled under the general provisions of the Act of 1906 silicosis in certain industries has been dealt with under the special provisions of the Workmen's Compensation (Silicosis) Acts.

Physical Impairment of Rural Children.

Mr. SCURR asked the President of the Board of Education whether his attention had been drawn to the report of the chief medical officer of the Board as to the deterioration in the physical standard of children in rural areas; and whether, in view of the effects on the nation, he proposed to take any action in the matter.—The DUCHESS of ATHOLL (Parliamentary Secretary to the Board of Education) replied: The report in question, while stating that there was a substantial degree of physical impairment among rural children, added that there were good grounds for believing that on the whole there was improvement, and in some rural areas great improvement. The remedy lies in the main along the lines on which the Board and local authorities have been steadily working in the past, and what is needed is perseverance on these lines, especially in regard to the replacement of unhealthy school buildings, rather than any new departure of policy. As regards the chief medical officer's recommendstion that children under 6 years of age in rural areas should be discouraged from attendance at school in certain circumstances, my right hon. friend is considering whether there is any advice which he can usefully tender to local authorities on this point.

Small-pox and Vaccination.

Major MACANDREW asked the Minister of Health whether, in view of the spread of small-pox, he intended to resort to the more widespread use of vaccination.—Mr. N. CHAMBERLAIN replied: In areas invaded by small-pox it is the usual practice for the local authorities to urge the importance of vaccination and to announce the facilities for vaccination free of cost to all who desire it, but there is no statutory provision for compulsory vaccination, except in the case of children whose parents have not made declarations of conscientious objection to vaccination.

The General Medical Council.

Mr. STORRY DEANS asked the Minister of Health whether he had considered the suggestion that the General Medical Council ought to contain a lay element; and, if so, having regard to the power of nomination conferred on the Crown by the Medical Act, 1886, he would take steps to secure that this power should be exercised by the appointment of laymen as and when vacancies arise.—Mr. N. CHAMBERLAIN replied: Yes, Sir, I have considered my hon. friend's suggestion and I will take an early opportunity of consulting the Lord President on the matter.

Milk and Dairies Order.

Mr. ROBERT MORRISON asked the Minister of Health if he was yet in a position to state when the draft orders made by him under Section 1 of the Milk and Dairies Act, 1915, would be published.—Mr. N. CHAMBERLAIN replied: I hope to publish the draft order in question in the course of a few weeks.

Tuberculosis in the Navy.

Dr. V. DAVIES asked the First Lord of the Admiralty the number of officers and men who had been invalided out of the Service during the last three years, for which records were available, suffering from pulmonary tuberculosis; and in how many of these cases the disease had been considered as not attributable to the conditions of service.—Mr. DAVIDSON replied: The total numbers of officers and men invalided for pulmonary tuberculosis during the years 1923, 1924, and 1925 were as follows: 1923, 132; 1924, 150; and 1925, 197. The numbers of these cases in which the disease has been considered as *not* attributable to the conditions of Service were as follows: 1923, 128; 1924, 145; and 1925, 192.

MONDAY, FEB. 22ND.

Europeans and Indian Medical Service.

Mr. ROBERT RICHARDSON asked the Under-Secretary of State for India whether he would inform the House as to the proposals being made by the Government of India with a view to reserving the civil posts of the Indian Medical Service for Europeans.—Earl WINTERTON replied: This matter is still under consideration, and I regret that I am not at present able to make a statement.

Tuberculin Tests.

Lieut.-Colonel FREMANTLE asked the Minister of Agriculture if he could give figures showing the number of milch cattle that had been subjected to the tuberculin test within the past year, and the number that had been reacted.—Sir K. WOOD replied: There are very few official records of tuberculin tests other than those carried out for the purpose of the Milk (Special Regulations) Order. The number of cows tested for this purpose in 1924 was about 6000, the majority of which had already passed the test on one or more previous occasions, and the number which reacted in that year was 732. In 1925 the number tested and re-tested was nearly 7500, but I am not yet able to state the number of reactors.

Small-pox and Vaccination.

Mr. LANSBURY asked the Minister of Health whether he was aware that the outbreak of small-pox in the years 1901–02 coincided with an increase in the number of vaccinations performed in consequence of the passing of the Vaccination Act, 1898; and whether he would state the number of cases of small-pox notified in the years 1897, 1898, 1899, 1900, 1901, 1902, 1903, and 1904, and the number of infants vaccinated out of every hundred born in each of those years.—Sir K. WOOD replied: It is the fact that the total numbers of vaccinations and revaccinations performed during 1901 and 1902 at the cost of the rates was considerably in excess of the numbers in previous years. But, as the primary object of the Vaccination Act, 1898, was to exempt from penalties parents who obtained certificates of conscientious objection to vaccination, this increase cannot, in my right hon. friend's opinion, be attributed to the passing of that Act, but rather to the fact that when small-pox is prevalent, as in 1901–02, it is usually found that large numbers of persons seek the protection afforded by vaccination. As regards the last part of the question, figures are not available showing the number of cases of small-pox notified during the years in question, but the following is a statement giving percentage of vaccinations to births in each of these cases:—

Percentage of Vaccinations to Births.—1897, 62·4; 1898, 61·0; 1899, 66·4; 1900, 68·7; 1901, 71·4; 1902, 74·8; 1903, 75·4; 1904, 75·3.

Mr. GROVES asked the Minister of Health if he would request the committee which he had appointed to report from time to time on matters relating to vaccination, to furnish him in their first Report with replies to the following queries: what is the precise nature of the disease from which vaccine lymph is derived and how is its nature determined; what is a successful and efficient vaccination and for how long can it be guaranteed to remain so; how frequently has it been found possible to repeat vaccination on the same person; what is the relation of the possibility of frequently repeating vaccination to the question of immunity; and what means are recommended for ascertaining whether the immunity afforded by vaccination has lapsed.—Sir K. WOOD replied: My right hon. friend will communicate these suggestions to the Committee on Vaccination for their consideration.

Mr. CHARLES WILLIAMS asked the Minister of Health what steps he was taking to inform the public of the efficiency of vaccination against small-pox, particularly in those areas where there was any sign of this disease.—Sir K. WOOD replied: It is the duty of the local authorities of areas in which any case of small-pox occurs to urge the importance of vaccination and the efficiency of this method of protection against small-pox, and it is the usual practice of the local authorities to take these steps.

Death-rates in India.

Mr. SCURR asked the Under-Secretary of State for India whether he could state the death-rate, adult and infantile, for Howrah for the last five years.—Earl WINTERTON replied: The latest information is as follows: The death-rates per 1000 of the population for all ages were as follows: 1919, 55·1; 1920, 48·5; 1921, 35·3; 1922, 29·8; 1923, 28·8. The rates of infantile mortality per 1000 births

registered were: 1919, 363·0; 1920, 391·0; 1921, 284·1; 1922, 250·1; 1923, 263·9.

Mr. SCURR asked the Under-Secretary of State for India the death-rate, adult and infantile, for Cawnpore and cantonment for the last five years.—Earl WINTERTON replied: The latest information is as follows: The death-rates per mille for all ages were:—

Cawnpore City.—1919, 63·60; 1920, 60·34; 1921, 48·38; 1922, 44·53; 1923, 49·73.

Cawnpore Cantonment.—1919, 31·65; 1920, 23·89; 1921, 23·79; 1922, 15·69; 1923, 13·96. The infantile mortality rates in Cawnpore City per 1000 births registered were: 1920, 551·07; 1921, 580·67; 1922, 450·87; 1923, 495·17; 1924, 476·90. The rates for the cantonment are not available.

Mr. SCURR asked the Under-Secretary of State for India whether he could state the death-rate, adult and infantile, in the city of Calcutta and suburbs for the last five years.—Earl WINTERTON replied: The latest information is as follows: The death-rates per mille for all ages were: Calcutta (including suburbs), 1919, 42·2; 1920, 39·4; 1921, 33·5; 1922, 29·1; 1923, 28·4. Separate figures for the city and suburbs are not available. The rates of infantile mortality per 1000 births registered in Calcutta (including suburbs) were: 1910, 357·0; 1920,* 386·0; 1921, 330·5; 1922, 287·0; 1923, 294·6.

TUESDAY, FEB. 23RD.

Deaths from Gas Poisoning.

Mr. SCURR asked the President of the Board of Trade whether his attention had been called to the number of deaths occurring in London from gas poisoning; whether he was aware that coal gas in these days was poisonous because it contained water gas, the chief constituent of which was carbon monoxide; and whether, in view of these circumstances, he would cause an inquiry to be made with a view to making regulations for the better security of life.—Sir BURTON CHADWICK (Parliamentary Secretary to the Board of Trade) replied: Special provision is made for recording particulars of deaths attributed to poisoning by gas supplied for use by the public. During 1925, in the areas supplied by the three London gas companies, there were 27 such deaths in which either an open verdict or a verdict of accidental death was returned. I am aware that the use of water gas in towns gas increases the proportion of carbon monoxide beyond that found in ordinary coal gas. The hon. Member will be aware that the matter was reported upon in great detail in 1924, and the Government are watching the position most carefully and closely, but at present it is not considered that a further inquiry would serve any useful purpose.

Training of Midwives in Scotland.

Dr. SHIELS asked the Secretary for Scotland, in view of the new regulations for the training of midwives coming into force in May of this year and the difficulty of meeting the full extra costs by increased fees to pupil nurses in the Scottish maternity hospitals, if he would try to secure for Scotland the same grants in aid which were promised for similar hospitals in England and Wales.—Sir J. GILMOUR replied: I regret that I am unable to take the action proposed for the reason stated in my answer to the question put by Captain Wedgwood Benn on Feb. 15th. In view of the interest of Members in this subject, and the difficulty of dealing adequately with it by the method of question and answer, I have had an explanatory memorandum prepared which I am forwarding to the hon. Member and which I should be glad to make available to Members interested. At the same time I fully appreciate the special difficulty with which the maternity hospitals may be faced, and am keeping it in view in considering the report of the Departmental Committee on the hospital position in Scotland.

Health of Women Telephonists.

Mr. SPOOR asked the Postmaster-General if he could give any indication of the general health of women employed in post-office telephone exchanges; and whether any medical statistics were available showing the causes and prevalence of illness.—Sir W. MITCHELL-THOMSON replied: The statistics for 1924, which are the latest at present available, show that the average numbers of days of sick absence for telephonists were: In London, 12·6 days; in provincial districts of England and Wales, 12·2 days; in Scotland, 13·4 days; in Northern Ireland, 12·3 days. The average sick absence of the whole established female staff on the post-office in 1924 was 12·7 days. I regret that no statistics are available of the numbers of days' absence attributable to particular diseases.

* The birth registration system is said to have been defective n this year.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MONDAY, March 1st.—8.30 P.M., Social Evening. 9.30 P.M., Dr. Gustave Monod: Illustrated address, From Cagliostro to Coué; or, Imagination as a Method of Treatment.
TUESDAY.—8.30 P.M., ORTHOPÆDICS (Cases at 8.15 P.M.). Discussion: Late Results of Operation for Chronic Painful Hip. 8.30 P.M., PATHOLOGY, at the Lister Institute, Chelsea-gardens, S.W. Dr. E. E. Atkin: The Rationale of the Bile-Solubility Test. Mr. P. Bruce White: Some Observations on the Salt Stability of "Rough" Variants. Dr. F. M. Burnet: Experiments on the Influence of Ultra-violet Light and Hydrogen Peroxide on Bacterial Growth. Dr. G. H. Eagles: The Preparation of Toxic Filtrates of the Streptococcus.
WEDNESDAY.—8.30 P.M., SURGERY, MEDICINE, ELECTRO-THERAPEUTICS, THERAPEUTICS. Discussion: The Treatment of Exophthalmic Goitre.
THURSDAY.—5.15 P.M., BALNEOLOGY AND CLIMATOLOGY. Dr. F. G. Crookshank: Airs, Waters, and Places. 8 P.M., OBSTETRICS AND GYNÆCOLOGY. Dr. Herbert Spencer: Carcinoma Adenomatodes Cervicis Uteri. Mr. H. F. Symonds: A Method of Endoscopic Examination of the Uterus, with its Indications. Mr. C. Lane-Roberts: A Case of Pregnancy Complicated by Ureteric Calculus. Dr. G. Strachan: Vaginal Polypi in Infants with a Report of Two Cases. Dr. Gibbon FitzGibbon: A Revised Conception of Antepartum Accidental Hæmorrhage. Dr. Theobald: A Plea for Drastic Reforms in the Teaching and Practice of Midwifery.
FRIDAY.—5 P.M., LARYNGOLOGY (Cases at 4 P.M.). Discussion: Atrophic Rhinitis. 8.30 P.M., ANÆSTHETICS. Dr. C. E. Lakin: Anæsthesia in Relation to Disorders of the Circulation.
SATURDAY.—10.30 A.M., OTOLOGY (Cases at 9.45 A.M.). Sir William Milligan will read a paper. Mr. H. G. Estcourt (introduced by Mr. F. J. Cleminson): Gradenigo's Syndrome. Demonstration: Mr. A. R. Fried: Experiments on Ion Action.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, March 2nd.—5 P.M., Prof. W. W. C. Topley: Experimental Epidemiology (first Milroy Lecture).
THURSDAY.—5 P.M. (second Milroy Lecture).

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.
MONDAY, March 1st, to SATURDAY, March 6th.—Fellowship of Medicine Lecture, at the Medical Society, 11, Chandos-street, W. Thursday, at 5 P.M., Dr. E. P. Poulton: Dyspepsia. Free to all members of the medical profession.—ROYAL EYE HOSPITAL, St. George's Circus, Southwark, S.E. A series of Demonstrations on the Diagnosis and Treatment of Diseases of the Eye. Monday and Friday, at 3 P.M.—WESTMINSTER HOSPITAL, S.W. Special Course in Bacteriology. Two-hour sessions twice weekly on Tuesday and Thursday. General Laboratory Methods (Sterilising, Media-making, and Staining, &c.). Further information from the Secretary of the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, March 1st.—10 A.M., Surgical Out-patients: Mr. W. E. Tanner. 10.30 A.M., Gynæcological Operations: Mr. A. E. Giles: Throat, Nose, and Ear Operations: Mr. W. Ibbotson. 2 P.M., Medical, Surgical, and Gynæcological Clinics, Operations. 6.30 P.M., Venereal Department.
TUESDAY.—2 P.M., Medical, Surgical, Throat, Nose, and Ear Clinics, Operations. 4.30 P.M., Mr. A. Goodwin: Treatment of Vaginal Discharges.
WEDNESDAY.—10.30 A.M., Surgical Operations: Mr. E. Gillespie. 2 P.M., Medical, Eye, and Skin Clinics, Operations. 5.30 P.M., Venereal Department.
THURSDAY.—10.30 A.M., Dental Out-patients: Mr. E. S. Pierrepont. 2 P.M., Medical, Surgical, and Throat, Nose and Ear Clinics, Operations. 5 P.M., Operations.
FRIDAY.—10.30 A.M., Eye Operations: Mr. N. Fleming. 2 P.M., Surgical, Medical, and Children Clinics, Operations. 3 P.M., Gynæcological Clinic. 6.30 P.M., Venereal Department.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.
THURSDAY, March 4th.—5 P.M., Dr. G. V. Anrep: Regulation of the Coronary Circulation (Sydney Ringer Memorial Lecture).

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, March 5th.—4 P.M., Dr. Dan McKenzie: The Surgical Anatomy of the Temporal Bone (illustrated by lantern slides).

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.
WEDNESDAY, March 3rd.—Dr. Harrison: Gastric Analysis.
THURSDAY.—4 P.M., Dr. Thursfield: Idiopathic Purpura.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.

POST-GRADUATE COURSE: FEBRUARY–MARCH.

CLINICAL LECTURES AND DEMONSTRATIONS.

MONDAY, March 1st.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., The Neuro-Muscular System, II., Motor Automatism: Dr. Kinnier Wilson.

TUESDAY, March 2nd.—2 P.M., Out-patient Clinic: Dr. Walshe. 3.30 P.M., Syringomyelia: Dr. Hinds Howell.

THURSDAY, March 4th.—2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., Neuro-Syphilis, II.: Dr. Riddoch.

FRIDAY, March 5th.—2 P.M., Out-patient Clinic: Dr. Adie. 3.30 P.M., The Diagnosis of Muscular Atrophy which is Progressive: Dr. Collier.

The fee for the Course, including Pathology lectures, is £5 5*s*. For those who hold Perpetual Tickets the fee is £3 3*s*.

Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M., or at such other times as may be announced.

Any part of the Course may be taken separately. Special arrangements will be made for those unable to take the whole Course.

Fees should be paid to the Secretary of the Hospital at the Office on entering for the Course.

J. G. GREENFIELD, Dean of Medical School.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, Leicester-square, W.C.

TUESDAY, March 2nd.—5 P.M., Dr. Wilfrid Fox: Cutaneous Syphilis (2).

THURSDAY.—5 P.M., Dr. S. E. Dore: Alopecia.

ROYAL DENTAL HOSPITAL OF LONDON SCHOOL OF DENTAL SURGERY.

WEDNESDAY, March 3rd.—8.30 P.M., Mr. F. St. J. Steadman: The Treatment of Overcrowding of the Dental Arches.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

FRIDAY, March 5th.—3.30 P.M. (at the Royal Hospital), Mr. Townrow: Demonstration of Nose and Throat Cases.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.

TUESDAY, March 2nd.—4.15 P.M., Dr. F. Craven Moore: The Diagnosis of Nephritis.

FRIDAY.—4.15 P.M., Dr. G. E. Loveday: Laboratory Demonstration.

ST. MARY'S HOSPITALS, MANCHESTER, POST-GRADUATE LECTURE.

FRIDAY, March 5th.—4.30 P.M. (at Whitworth-street West Branch), Dr. J. W. Bride: Toxæmias of Pregnancy.

Appointments.

EYNON, C. M., F.R.C.S. Edin., M.D. Ont., has been appointed Surgeon in Charge of a hospital in connexion with the Welland Canal construction at St. Catherine's, Ontario.

TAYLOR, R. S., M.B., Ch.B. Liverp., F.R.C.S. Edin., Honorary Surgeon to the Lock Department of the Royal Infirmary, Liverpool.

Sheffield Royal Hospital: BARRON, D. C., M.D., Ch.B. Edin., WILLEY, H. L., M.B., B.Ch. Camb., HOLDSWORTH, C. D., M.D., B.S. Lond., PLEASANCE, R. E., M.D., Ch.B. Sheff., PAIGE, E. F., M.B., Ch.B. Sheff., Honorary Clinical Assistants; IMRIE, C. G., M.R.C.P. Lond., M.D. Ont., Medical Registrar; YATES, H. BLACOW, M.B., B.Ch. Sheff., F.R.C.S., Surgical Registrar; HOLMES, E., M.B., Ch.B. Leeds, Resident Surgical Officer; Drs. EVERARD, WALKER, FAWCETT, HATHERLEY, JAGO, SYKES, L. JAGO, and FLINT, Resident Surgical Officers.

Certifying Surgeons under the Factory and Workshop Acts: YOUNG, J. M., M.B., B.Ch. Belf. (Rothwell District of York); MACDIARMID, A. J., M.B., Ch.B. Aberd. (Ryde); MANSON, M., M.D., Ch.B. Glasg., D.P.H. (Whitehaven, Cumberland); FIRTH, I. G. M., M.B., Ch.B. Aberd. (Tenbury, Worcestershire); and ANDERSON, D. H., M.B., C.M. Edin. (Tunbridge Wells: SMITH, R. G., L.R.C.P. Lond., M.R.C.S., (Southend); MANSFIELD, H. Y., M.D., B.Ch. Camb. (Yarmouth, I.W.); WILLIAMS, H. C., M.B., B.Ch. Camb. (Alton); WHITE, R. F., M.B., Ch.B. Bristol (Nailsea, Somerset).

Vacancies.

For further information refer to the advertisement columns.

Ayr County Hospital.—Jun. H.S. At rate of £80 for first six months.

Bath, Winsley Sanatorium.—Asst. Res. M.O. £250.

Birmingham General Hospital.—Part-time Clin. Asst. in Ven. Dept. £350.

Birmingham, Queen's Hospital.—H.P., H.S.'s, Cas. H.S., and Res. Anæsthetists. Each £70.

Bolingbroke Hospital, Wandsworth Common, S.W.—Res. M.O. £200.

Buxton, Derbyshire, Devonshire, Hospital.—Asst. H.P. At rate of £150.

Central London Ophthalmic Hospital, Judd-street, W.C.—Asst. S.

Charing Cross Hospital.—Surg. Reg., Med. Reg. Each £150. Also Obstet. Reg.

Croydon Mental Hospital, Upper Warlingham, Surrey.—Asst. M.O. £350.

Derbyshire Royal Infirmary, Derby.—Hon. Dental S.

Dunfermline Burgh.—M.O.H. £800.

Essex Administrative County.—Asst. Tuberculosis O. £700.

Exeter, Royal Devon and Exeter Hospital.—H.P. and Asst. H.S. Each at rate of £130.

Freemasons Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Res. M.O. At rate of £250.

General Lying-in Hospital, York-road, Lambeth, S.E.—Res. M.O. At rate of £100.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Hon. Ear, Nose and Throat S.

Italian Hospital, Queen-square, W.C.—Hon. Ophth. S.

Kettering and District General Hospital.—Res. M.O. At rate of £150.

Liverpool, Royal Southern Hospital.—Hon. Asst. S.

London County Council. Public Health Dept.—Sen. M.O. £1219 12*s*. 10*d*.

London Hospital, E.—Vacancy on Hon. Surg. Staff. Gynæcological Reg. £400.

Manchester, Royal Children's Hospital, Gartside-street.—Asst. M.O. At rate of £150.

Manchester, Royal Children's Hospital, Pendlebury.—Res. Surg. O. At rate of £80.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. At rate of £150.

National Hospital for the Paralysed and Epileptic, Queen-square, W.C.—Med. Reg. £200.

Northumberland County Council, Wooley Sanatorium, near Hexham.—Asst. Med. Supt., &c. £600.

Nottingham General Hospital.—H.P. At rate of £150.

Nottingham, Ransom Sanatorium.—Asst. Res. M.O. £375.

Oxford, Radcliffe Infirmary and County Hospital.—Cas. H.S. At rate of £120.

Plymouth, Homœopathic and General Hospital.—H.S. £150.

Plymouth, Udal Torre Sanatorium, Yelverton.—Res. M.O. £450.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Dist. Res. M.O. At rate of £80.

Queen Mary's Hospital for the East End, Stratford, E.—Hon. Asst. Obstet. S.

Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—H.S. At rate of £100. Res. M.O. £200. R.P. At rate of £100.

Richmond, Surrey, Royal Hospital.—Hon. S. to Out-patients.

Royal Free Hospital and Lond. Sch. of Medicine for Women, Gray's Inn-road, W.C.—Sen. Asst. Path. Full-time. £600.

Royal Northern Hospital, Holloway, N.—H.S. and Obstet. H.S. Each at rate of £70.

St. John's Hospital, Lewisham, S.E.—Res. H.S. At rate of £100.

St. Mary Abbots Hospital, Marloes-road, Kensington.—Asst. Res. M.O. £450.

St. Mary's Hospital, W.—Second Asst. Pathologist. £250.

Salford County Borough, Infectious Dis. Hosp., Ladywell Sanat., Pendleton.—Res. M.O. £350.

Salford Royal Hospital.—H.P. and H.S. Each at rate of £125.

Salisbury General Infirmary.—H.S. £150.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.

Singapore Municipality, Straits Settlements.—Asst. Health O. £1008.

Southampton, Royal South Hants and Southampton Hospital.—Jun. H.S. At rate of £150.

Stoke-on-Trent, North Staffordshire Royal Infirmary.—Jun. H.P. £125.

West London Hospital, Hammersmith, W.—H.P. and two H.S.'s. Each at rate of £100.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. and Jun. H.S.'s. At rate of £150 and £100 respectively.

Windsor, King Edward VII. Hospital—Hon. Asst. S.

York County Hospital.—H.P. £150.

The Chief Inspector of Factories, Home Office, London, S.W., announces a vacancy for a Certifying Factory Surgeon at Caerleon, Monmouth.

Births, Marriages, and Deaths.

BIRTHS.

HEARN.—On Feb. 16th, at Buckland-crescent, Hampstead, N.W., the wife of Reginald J. Hearn, M.D., of a daughter.

OLIVER.—On Feb. 13th, at Edgefield, St. Peters, Jersey, C.I., the wife of Dr. H. G. Oliver, M.C., of a daughter.

SCHLESINGER.—On Feb. 16th, at Hollycroft-avenue, N.W., the wife of Bernard E. Schlesinger, M.B., B.Ch., M.R.C.P., of a son.

WRIGHT.—On Feb. 15th, at Warwick Lodge, Warwick-avenue, W., the wife of Dr. E. T. Wright, of a daughter.

DEATHS.

DERHAM-REID.—On Feb. 17th, at his residence, Auchinellan, St. Helens-road, Bolton, Major James Derham Reid, M.C., R.A.M.C. T. (retd.), M.R.C.S. Eng., L.R.C.P. Lond., of Auchinellan, Argyll.

ROBERTS.—On Feb. 18th, at Southport, Lieut.-Colonel Hugh Jones Roberts, F.R.C.S., D.L., J.P., of "Llywenarth," Penygroes, Carnarvonshire.

SMITH.—On Feb. 19th, at St. George's-road, Wimbledon, Surrey, William Woodriff Smith, M.D., in his 82nd year.

SWANN.—On Feb. 16th, at Cambridge, from blood poisoning contracted while performing a post-mortem examination, Meredith Blake Robson Swann, M.D., Fellow of Gonville and Caius College, aged 32 years.

*N.B.—A fee 7*s*. 6*d*. is charged for the insertion of Notices of Births, Marriages, and Deaths.*

Notes, Comments, and Abstracts.

SOME MEDICAL INVENTORS.

PATENT offices have for some time been attracting attention, it being felt by authority on both sides of the Atlantic that reform is needed in a sphere where much human endeavour continues to be wasted. In the United States, where it has hitherto been necessary for patentees to present complete models of their inventions with their specifications, it has even been proposed to burn the museum devoted to the display of patents. At the rate that models accumulate in an intensely inventive atmosphere, Washington is in danger of becoming a museum of machines. Hence the proposed holocaust.

Sewing-machine and Steam.

Were this to take place much that is curious would be destroyed, and much designed to promote human welfare. That many of the projectors were medical men goes without saying, for medical men are clever with their fingers and prone to find out short cuts in manipulative procedure. Surgeons have, indeed, invented innumerable instruments and surgical contrivances, but what is not generally known is that medical men have often been what may be called lay inventors. Sometimes their contribution to public utility and the culture-drifts of civilisation has been indirect. Thus William Rawlings Beaumont, M.D., F.R.C.S. (1803–1875), was quite unintentionally the originator of Singer's variant of the sewing-machine. In 1836 he invented a small contrivance for stitching cleft palate, now in the museum of the Royal College of Surgeons, and this, when exhibited in a shop window in New York, caught the eye of Mr. Isaac M. Singer, who adapted its principle to his sewing-machine. Singer made a large fortune. Beaumont, on the other hand, died far from a millionaire. In 1867 he writes to his correspondent, Thomas Madden Stone, secretary of the Royal College of Surgeons of England: "I am obliged to work on at my profession (probably the better for me), tho' it has been but a profitless occupation, for I was really much better off in a pecuniary point of view above 30 years ago than I am now. I made from the first the mistake of not becoming a general practitioner—of not practising midwifery." At the time of writing, although blind of one eye, he was still operating and still the admired professor of clinical surgery at the University of Toronto. It is noteworthy, however, that he says nothing here of his famous observation on gastric digestion in the case of Alexis St. Martin, nor of his numerous inventions. It was left to his clever fussy correspondent, "Tommy" Stone, to boom the surgical sewing-machine in THE LANCET, when he wrote of this instrument as "destined to make an epoch in the world's history." The sewing-machine on Singer's plan is, relatively speaking, no great matter, and we ask: What of the major discoveries and inventions? What of steam, for instance? And has there been a medical name in the process of the slow evolution of the steam-engine? It is doubtful, indeed, whether Dr. Peter Chamberlen (1601–83), to whom the invention of the short midwifery forceps is perhaps erroneously attributed, had got hold of the idea of the locomotive engine when, in 1682, he petitioned Parliament for an Act to protect "the new invention of navigating with all winds in a straight line." He had patented this invention in France, the Netherlands, and Venice, and now asked the English Parliament to protect him; but as he refused to show a model of his invention, it is difficult to see what Parliament could protect beyond a secret. Peter Chamberlen's life, wrote Sir Norman Moore, "was one long succession of schemes." In 1648 he sought to institute "public artificial baths" by Act of Parliament. In 1649 he proposed to propel carriages by wind, and his petition of 1682 may refer to these. More probably, however, it has to do with an apparatus for navigating vessels in a straight line in all winds. In 1730 Dr. John Allen patented two inventions which, if they had been carried out, would probably have resulted in the first steam-boat. He proposed to construct an engine for raising water by means of fire, which, when placed in a ship, would force water out of the stern, thus enabling the ship to move in a calm.

Shorthand and Sanitation.

Minor inventions by physicians were noted in 1917 by that careful antiquarian, the late Dr. Samuel Dodd Clippingdale. Thus Dr. Timothy Bright, of Cambridge, was the inventor of modern shorthand as opposed to the lost art described by him in his work, "Characterie" in 1588. Dr. David Bridges, of Hull, in about the year 1780, invented spermaceti candles. Dr. Neil Arnott was the inventor about the year 1832 of a ventilating chimney and a smokeless grate. Traction of barges by horses instead of by men is said to have been introduced by Dr. Battie, of Marlow. The Gatling gun is named after Dr. Richard Gatling, who invented this form of artillery in 1861. And, finally, the guillotine is named after Dr. Joseph Ignatius Guillotin.

These were physicians; the surgeons who have made useful inventions are more numerous.

On reference to the enormous index to the "Roll" of the Fellows of the Royal College of Surgeons of England which, regrettably enough, remains in MS., a respectable list may be made out of what are properly lay inventions due to the genius of surgeons. Proceeding alphabetically from the above-mentioned Rawlings Beaumont we come to Peter Hinckes Bird, F.R.C.S. (1827–91), who in 1862 was the inventor of a "costless system of ventilation." This suggests no more than open windows, though the inventor received several certificates and medals, and the invention was fully described in *The Builder*, March 1st, 1862. Charles Brooke, F.R.C.S. (1804–79), was twenty-third wrangler in 1827, and a most distinguished inventor. He was the author of some improvements in microscopy, but his fame chiefly rests on his barometers, thermometers, psychrometers, and magnetometers, which registered their variations photographically and were known as "self-recording instruments." They were adopted by the Royal Observatories of Greenwich, Paris, and other meteorological stations, and brought their author the premium offered by the Government as well as a council medal at the Great Exhibition of 1851.

Medical men have naturally played a part in sanitary reform, such as the introduction of improved drainage, water-supply, gas-lighting, and so forth. In this sense hosts of little-known practitioners have been innovators, if not inventors. The dress of the City policemen was designed by a surgeon, George Borlase Childs, F.R.C.S., who was born in 1816 and was for many years surgeon-in-chief to the City of London police. He, in fact, in 1861 introduced the helmet as we now know it, and thus emphatically contributed to the *mise en scene* of London streets.

Miscellaneous Inventions.

Surg.-General Saville Marriott Pelly, C.B., F.R.C.S. (1819-95), was the inventor of an electric clock, though this is somewhat overshadowed by his electric stethoscope, which enabled all the members of a class to listen at the same time to one heart. Like many others, Pelly made both lay and medical inventions. Such inventors were George Armstrong Peters, M.B., F.R.C.S. (1859–1907), who invented a self-registering rifle-target, which is named after him; Sir William Rae, C.B., M.D., F.R.C.S. (1786–1873), who invented an apparatus for distilling water; and George Rowell, M.D., F.R.C.S., who died about 20 years ago and was the inventor of a milligrade thermometer. In the same useful category as the policeman's helmet must be classed the sweeping-machine for use in city streets, which we owe to Sir Edwin Saunders, F.R.C.S., the dentist to Queen Victoria (1814–1901). A prolific inventor and remarkable man was Alfred Smee, F.R.C.S., F.R.S. (1818–77), a son of the accountant-general to the Bank of England, who lived in the bank with his father. On the recommendation of Sir Astley Cooper he was appointed surgeon to the bank, Cooper being of opinion that his genius as a man of science might be turned to good account there. He invented Smee's battery, which is named after him, and used for trade purposes. We also owe to him durable writing ink (1842), and the present system of printing cheques and notes at the Bank of England, finally perfected by him in conjunction with two others in 1854, when, as Sir D'Arcy Power says in the "Dictionary of National Biography," "certain modifications were introduced into the manufacture of the notes to prevent or render it impossible any longer to split them." To James Startin, F.R.C.S. (1806–72), otherwise a fertile surgical inventor, we owe a process for stiffening felt hats; and to the famous James Syme, D.C.L. Oxon., M.D., F.R.C.S. (1799–1870), is due water-proofing (caoutchouc in solution applied to the preparation of waterproof cloth). Syme gained nothing by his discovery, which was patented by a Glasgow manufacturer. "Mackintoshes" are, however, not attributed to the patentee in Scotland always, and in France they are called "Macfarlanes," as though their wearers were conscious of some misstatement in the English name. To Robert Temple Wright, M.D., F.R.C.S. (1843–1902), of the Indian Army, is due the vermin-free "Indian Bungalow," the Milver ambulance cart, and various improvements in military kit.

Some inventions of medical men appear humorous. Thus Sir William Petty, professor of anatomy at Oxford and a famous political economist, tickled both Charles II. and Pepys with his invention of a boat with two keels. Dr. Francis Moore originated "Old Moore"; and, latterly, William Henry Stone, M.A., F.R.C.S., censor of the Royal College

of Physicians in 1884, struck a quaint note with his bassoon capable of uttering a sound lower in the scale than any hitherto emitted.

The attribution of inventions is a delicate matter. Yet it is to the credit of the profession that so few are quarrelled over. Instruments are too often quietly ceded by their medical inventors to the manufacturers and the instrument makers. We can, in a long list, only find one instrument—and that not a surgical one—claimed by two surgeons. Thus, Lund's well-known "corkscrew lever" seems to have been claimed by another. But neither surgeon fought over the matter. Often, too, inventions are, properly speaking, only first thought of by medical men and perfected by others. In the region of ideas such inventions might be called originations. Thus we might have cited Mouat's origination of the Indian universities, and class in the same category John Postgate's initiation of the later legislation against adulteration. John Postgate, F.R.C.S. (1820–81), started life as a grocer's boy, and having observed the tricks of the trade was led into a long campaign against impure food, which terminated in the passing of the Sale of Food and Drugs Act in 1875.

"SABBIATURA."

OF quite recent years the public have discovered for themselves the sensations of well-being which are to be derived from the warm sand-bath, and at some continental seaside resorts part of the day's sanitary régime consists of being buried and burying others in the hot expanse of the shores. Apart from physical enjoyment the hot sand-bath has properties which have been found useful in the treatment of such conditions as rheumatism, rheumatoid arthritis, neuritis, lumbago, sciatica, and forms of chronic synovitis, the treatment in these directions being specially studied and applied at the little old town of Alassio which is situated on the Italian Riviera, between Porto Mauritzio and Albenga, 23 miles from San Remo, where there is a fine strip of pure silica sands some three miles long. Unlike most places on the Italian Riviera, Alassio has both a winter and summer season, and during the latter period the dress of both sexes mainly consists of bright-coloured towelling with a shady head covering. There is practically no tide, and bathing in the warm water is safe even for children. The sabbiatura, as the hot sand-bath treatment is called, is carried out from the middle of May to the middle of September. A trench is prepared in the early morning and allowed to absorb the full heat of the sun till half an hour before noon when the patient is put into it and covered with the hot, dry sand. Here he remains for half an hour, during which time profuse perspiration takes place; he emerges coated thickly with wet sand. A plunge in the sea closes the sand-bath and washes the skin, and the patient emerges from the water invigorated and with a hearty appetite. A course of baths usually lasts from four to five weeks, but in transient cases of trouble may be shorter, and longer in more obstinate maladies. Medical supervision of these baths is offered at the Villa Iris, beautifully surrounded by a garden of palms and fruit and flowering trees under the shelter of Cape San Croce. Here heliotherapy and physical exercises are carried out all the year round under the direction of Dr. F. A. Barton, the superintendent of the treatment centre.

MULE-SPINNERS' CANCER.

Dr. Archibald Leitch, director of the Cancer Hospital Research Institute, London, and who was awarded the Manchester Christie Hospital prize for his last year's work, gave an address on mule-spinners' cancer at Manchester University on Feb. 19th. After describing in detail the work already done, he suggested that some of the first research undertaken by the Manchester Cancer Committee might be directed towards the discovery of a harmless non-irritant oil for use in cotton-mills. Until an oil was discovered which did not provoke the disease or until some method had been devised by which the spinner could be kept from contact with the oil, the only remedy for spinners' cancer was to have frequent medical inspection, so that the earliest lesions could be detected at a stage at which the disease could be prevented. A Government committee had been inquiring into the subject and would make its report shortly. The work of the committee was based in the first place on the work, about three years ago, of two Manchester surgeons, Mr. A. H. Southam and Mr. S. R. Wilson, and on information about the incidence of the disease which had been collected by Dr. S. A. Henry, medical inspector of factories. The records of the Manchester Royal Infirmary for 20 years showed that of 141 cases of cancer of the scrotum 69 had occurred in mule-spinners. During the last 50 years Dr. Henry had traced 539 cases of mule-spinners' cancer, the earliest record being in 1887. Yet two or three years ago neither the spinners nor their well-organised union had ever heard of the disease. In the general community the incidence was 4·1 per million; among spinners it was 134 per million; among chimney sweeps 534, and among patent fuel workers 608. There were about 23,000 mule-spinners in the country, and between the ages of 25 and 35 they were 14 times more liable to the disease than other people. From the ages of 45 to 65 their liability was 60 times that of the general population, and from 65 to 85 it was 100 times. The incidence of this form of cancer was not, however, connected with age; it varied with the length of time during which the operative had been subjected to the irritant, and was higher amongst the older men because they had been mule-spinners longer. The average time for the development of the disease was about 40 years. No case was known to have occurred in less than 10 years, and the longest time taken for development was 63 years. Dr. Leitch gave an historical account of the few cases that were discovered amongst tar-workers in Germany, amongst pitch-workers in South Wales, and in the shale oil industries in Scotland—in all about a score of cases in 50 years. The few isolated cases on the Continent were due to contact with crude oil, but the Lancashire cases among mule-spinners were due to contact with refined oils. The disease could be recognised before cancer had actually developed, and if caught in time could be prevented. Sometimes there was a delayed action and a person was not necessarily immune after he had left the trade. All workers were exposed to the oil, but only a very small proportion of them developed cancer. There was no such thing as a special susceptibility. A person might be liable to it at one time and not at another, just as to any other disease, and when once the cancerous stage was reached the only effective remedy was surgical.

POISONOUS SPIDERS.

THE greater part of the current number of *Memorias do Instituto de Butantan* (1925, Tomo II., Fasciculo Unico, Santo Paulo, Brazil) is taken up by an elaborate and interesting study of poisonous spiders, which are, unfortunately, somewhat numerous on the South American continent and also in various other parts of the world, including some European countries. The Italian tarantula is the most famous of all these pests, and the authors, Dr. Brazil and Dr. Velland, discuss briefly the question of tarantulism, epidemics of which were said to occur in the seventeenth and eighteenth centuries.

After a short historical retrospect, they give the results of their experimental investigation on the venom of several species, with a description of their technique, and describe the different effects, local and general, of the venoms of different species, and the results obtained by inoculation into animals. By the progressive inoculation of sheep they succeeded in obtaining a very active antiserum for the venom of two species and they recommend this method of treatment. There are a number of excellent illustrations, showing the spiders themselves, their poison glands (macroscopically and microscopically), and the lesions produced by them in men and animals. The lesions of some species are extensive local necroses, whilst the venom of others, which are far more deadly, acts mainly on the nervous system and is said to be as potent as that of the more dangerous snakes. There is an extensive bibliography at the end of the article.

CHRONIC NASAL DISCHARGE IN CHILDREN.

To the Editor of THE LANCET.

SIR,—With reference to the article on this subject in THE LANCET (1925, ii., 1132), in which the removal of foreign bodies from the nose is touched on, I should like to call attention to a very simple method that was shown us many years ago at Guy's by Mr. F. J. Steward. An ordinary butterfly-wing grooved director is taken and passed up the nasal cavity more or less parallel to the roof till its point is well above the foreign body; the portion of the director outside the nose is then raised till the point inside the nose is depressed sufficiently to come in contact with the floor; it is then "dragged out" of the nose, the point being kept in contact with the floor all the time, so that the foreign body is expelled in front of it.

Children in these parts not uncommonly push a seed of the Imli tree up their nose; this is about the size of a large "broad bean" and very quickly becomes too soft to be grasped by forceps but is easily removed in the manner described. This method is equally useful in dealing with hard, smooth spherical bodies such as large beads, pebbles, or marbles.

I am, Sir, yours faithfully,

H. WATTS,
Lieut.-Col., I.M.S.

Betul, C.P., India, Feb. 2nd, 1926.

THE new address of the Food Education Society is 24, Tufton-street (Great Smith-street), Westminster, S.W. 1. Tel.: Victoria 7145.